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CASSELL'S
ENCYCLOPÆDIA
OF GENERAL INFORMATION

WITH COLOURED PLATES AND MAPS
AND NUMEROUS FULL-PAGE ENGRAVINGS

CASTRO—DEODAR

SEVENTH EDITION

EDITH T. CASSELL, EDITOR
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AUTHORS OF PRINCIPAL ARTICLES.

CAT AND OTHER ZOOLOGICAL ARTICLES	HENRY SCHERREN, F.Z.S.	COMETS AND OTHER ASTRONOMICAL ARTICLES	O. G. JONES.
CAVALRY	COL. C. COOPER-KING, <i>Late Professor of Military History, Royal Military College.</i>	COMMON LAW AND OTHER LEGAL ARTICLES	C. ETHERINGTON.
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		DENMARK	MRS. A. SIDGWICK.

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LIST OF PLATES.

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CASSELL'S

ENCYCLOPÆDIA

OF GENERAL INFORMATION.

Castro, JUAN DE, born at Lisbon in 1500, and connected by family ties with the Portuguese throne, was educated with the Infante Luis, and began his career at Tangiers when only eighteen. In 1535 he served at the siege of Tunis, and about 1539 went out to Goa, where he distinguished himself in various expeditions. In 1543, having returned to Portugal, he was entrusted with a fleet to suppress piracy in the Mediterranean, and in 1545 he was again sent to India. He now performed a series of brilliant exploits, defeating Mahmoud, King of Cambodia, relieving the siege of Diu, overthrowing Abdul Khan, capturing Broach and Malacca, and effecting a passage into Ceylon. So popular was he that the merchants of Goa willingly raised a large loan on the security of his moustache. He was appointed viceroy in 1547, but died next year in the arms of his friend, St. Francis Xavier. His sons were also brave and capable explorers.

Castro, VACA, born at Vaca in the sixteenth century, was a soldier, and in 1541 he was sent over the government of the province of Vaca. His factional movements led to his assassination by the people in 1542. He was beheaded in 1542. The condition of the province was once therefore left to the hands of his countrymen. Referred to in the period in prison, he was a famous explorer.

Castro Giovanna, a town in the province of Catania, Sicily, situated between Catania and Syracuse, and formerly a fortified position. It was some time ago a colony of the city of Syracuse, but its position for being close to the city of Syracuse. It was then a town of 850 inhabitants. The town is a hair of the city of Syracuse.

temple of Ceres is now filled by the ruins of a castle built by Ferdinand II. of Aragon. The name is simply a corruption of *Castrum Ennæ*.

Castro del Rio, a town in the province of Cordova, Spain, and 16 miles S.E. of the city of that name, is situated near the river Guadajocillo. It has a fine town-hall, several churches and convents, etc., and the remains of ancient walls. There is a considerable trade in agricultural products, and coarse woollen and linen goods are made for local use.

Castro Villari, a fortified town in the province of Calabria Citra, Italy, 7 miles from Cassano. It stands on a height surrounded by lofty mountains, and possesses a massive Norman keep. The modern streets are well laid out. There is a considerable trade in wine, silk, cotton, fruits, and manure. At Monte Pollino, in the vicinity, a famous cheese is made.

Cast Steel. [IRON.]

Casuariidæ. [CASSOWARY.]

Casuistry, a kind of ecclesiastical case-law, which, by precedent and principle, declares the moral nature and value of an action with reference to a certain theological standard. The employment of casuistry has arisen out of the difference made between mortal and venial sin, the fact of a certain action being in the one category or the other depending upon a number of conditions, such as motive, opportunities of knowledge, or the like. The standards upon which the system of casuistry is based are Scripture, reason, the canons of the Church, and the opinion of eminent theologians. It is said to have originated with St. Raymond in 1228, and has been greatly developed since that time, culminating, perhaps, in the last century with St. Alfonso Liguori. But it is by no means confined to the Roman Church. The Jews had a system of casuistry in the Talmud. It is mentioned in the New Testament *apropos* of oaths by the altar or the gift on the altar; and in the Old Testament, when Naaman asks pardon beforehand for bowing himself in the house of Rimmon when in attendance upon his master, and the prophet bids him "go in peace," the principle of casuistry was certainly applied. It is a system well known to English law, and the satirical supposed case of the "black and white horses" was an application of it.

Casus Belli may be described as the last political straw that breaks the camel's back, and may consist of any act on the part of one nation towards another which forms the pretext for a war. Sometimes it is a well-understood step, at others the veriest trifle may determine a war. In the war between England and America in 1812 a claimed right of search, in the Crimean question the crossing of a river, in the Franco-German war a slight to an ambassador, formed the pretext.

Cat, the book-name of any species of the Felidæ, of the group *Æluroidæ*, of the order Carnivora. The family contains but one living genus—or, at most, two genera—and includes the typical carnivora. The lion, tiger, leopard, puma, jaguar, ounce, cheetah, and clouded tiger (all which see), are often called the large cats; and there are a number of smaller forms, to many of which the name "cat," with some distinguishing epithet, is applied. [CARACAL, OCELOT, SERVAL, TIGER-CAT.] Another division, distinguished by pencilled ears, may also be marked off from the main group. [LYNX.] The members of this family, widely distributed in both hemispheres, are specially fitted for a life of rapine; every part of the ordinary mammalian structure is organised for capturing, killing, and devouring living prey. Externally, these animals may be recognised by their lithe, agile form, small rounded head, well-proportioned, muscular limbs, close adpressed fur, stealthy movements, and keen eager glance—all necessary for their predaceous mode of life. Anatomically, the chief characters are their strong claws—retractile in all but the cheetah, their carnassial teeth [CARNIVORA], the rounded skull, and the division of the auditory bullæ into two parts by a bony partition. The tongue is furnished with little horny spines, used to rasp the flesh of their prey from the bones. In some forms, as in the domestic cat, the pupil of the eye is round only in the dark, when it is dilated to receive every available ray of light, but in the daytime it is contracted to a mere slit. "Wild cat" is a name given to several of the smaller cats of Asia and Africa, and sometimes to a feral race of *Felis domestica*, escaped from domestication. But the term is pre-eminently applied to *F. catus*, now confined to Southern Russia and the adjacent parts of Asia, Greece, Turkey, Central Europe, and Scotland. It has long been extinct in England, and probably never existed in Ireland, though there feral cats are of frequent occurrence, as in England. This animal is more strongly built than the domestic cat, and has a shorter tail, of uniform thickness, ringed with black and black at the tip. In general appearance it may be described as "a miniature tabby tiger." One killed at Cawdor Castle measured 45 in. over all. It is a solitary nocturnal animal, preying on birds, and small mammals, especially rabbits, and killing far more than it can eat; its disposition is very savage, and it has been known to attack man.

The domestic cat (*F. domestica*) is quite a distinct species, probably descended from the Egyptian cat (*F. maniculata*), which was certainly domesticated more than 3,000 years ago, and worshipped in some cities and embalmed after death.

The strain, however, is decidedly mixed, for the cat was domesticated in Europe more than 2,000 years ago, and there is little doubt that the Crusaders brought a distinct race with them from the East. The Jews must have been acquainted with the cat, but there is no reference to it in the Authorised Version, though it is mentioned in Baruch vi. 22. The great value set on these animals as mousers in the Middle Ages, is shown by the laws enacted for their preservation, and the severe fines inflicted on those who killed one. By a law of Howel the Good, a Welsh prince of the tenth century, anyone who stole or killed the cat which guarded the royal granary was to forfeit a ewe with its fleece and lamb, or as much wheat as would form a pile sufficient to cover the cat when held up by the tail with its nose touching the ground. The domestic cat runs into many varieties, chiefly of colour and fur. According to Dr. Mivart these are: (1) Black, with clear yellow eyes, and a few white hairs on the throat. The young show decided stripes or spots, especially on the limbs; (2) White, often with blue eyes, which are generally correlated with deafness; (3) Tabby—grey striped and mottled with black—probably the result of crossing with the wild cat; (4) Tortoiseshell, fawn mottled with black, generally females, though one good instance of a male is on record; (5) Grey, striped only over the fore legs; (6) Sandy, usually males. The Persian cat is remarkable for its size, and the length and fineness of its fur; the Siam cat is uniform fawn, with a dark muzzle; the Carthusian cat is uniform slate-grey, called "blue" by fanciers; the Manx and Crimean cats are tailless, but tailed specimens also exist in Man. Manx cats are sometimes called kangaroo cats, from the fact that the hind limbs are longer than the fore. There was said to be a breed with pendent ears in China, but Père David has shown this story to be without foundation. It is on record that a domestic cat has attained a weight of 23 lbs., but this is far above the average. About twelve years is the ordinary life limit, but 18 years have been reached, and there are many cases of intermediate periods. The habits of the cat are far too well known to need description. With domestication, however, they have acquired a fondness for articles of diet they could never obtain in a wild condition—cheese, fish, and milk. They sometimes develop a taste for sweet things, and the writer once had a cat with a strain of Persian blood that was extremely fond of melon. The sexual passions of the cat are very strong, and the cry of the sexes to each other is so ear-piercing as to have given rise to the verb "to caterwaul."

The cat is kept chiefly as a mouser, and it is estimated that one cat will destroy about twenty mice a day. But cats also act as preventives, and their mere presence will do much to rid a house of rodent plagues. Apart from its value as a mouser, the cat is often kept as a pet, and it is the fashion to decry its affection and intelligence as compared with the development of those qualities in the dog. Those who do so have never taken the trouble to win the confidence of a cat, which is not an ardent, but a very constant lover. Whoever has

done so, however, will have abundant reward for his pains. He will soon discover that the cat is not a whit behind the dog in intelligence, and its affection should be more valued because it is not lavished indiscriminately. The literature of the domestic cat is not voluminous. Mrs. Cashel Hoey's translation of Champfleury is a good book; but Pierre Loti's sketch *Vies de deux chattes* is the work of a true lover of cats, and should be read by all who doubt their intelligence and affection. Cats have suffered grievous things at the hands of animal painters. It is the fashion to depict them in human attitudes and occupations, and it is sad to see how plentiful these productions are in printsellers' windows. One of the greatest modern painters of cats is Mme. Ronner, and the pictures just alluded to bear about the same relation to her work as do the fencing frogs and cricketing squirrels that one sees in country "stuffers'" windows to the admirable reproductions of bird-life in the galleries at South Kensington. [WITCH.]

Cataclysm, an inundation or deluge, which in the Stoic cosmogony (based upon that of the Egyptians and resembling that of the early Brahminical writings) was believed to destroy the world alternately with the *ekpyrosis*, or destruction by fire. The belief in the necessity of such sudden and universal convulsions to explain geological phenomena was not abandoned until Lyell in the nineteenth century had enforced the uniformitarian teaching of Hutton and Playfair.

Catacombs, from *kata* and *kumbe* (c.f. *combe*, denoting a hollow, as *combe*, *Pycombe*, etc.), used to denote subterranean galleries such as are found beneath Paris, and the *hypogæa* of Rome. It is these latter which are usually spoken of as catacombs, and these there are some forty in all. They may be generally described as being worked in the volcanic tuff which is soft to be easy of excavation, and high enough to support the overlying strata. At an early period they were used as places not only as burial-places, but to carry on their forbidden meetings the Emperor Valerian in 257 A.D. ordered them to be closed, and the next year revoked the order. In the fifth century the *hypogæa* were converted into cemeteries, and were afterwards used as such until the fifth century. They have since been generally abandoned, and a part of them have been converted into sculpture galleries. It is said that they were at a later date used as a mysterious tributed to the well-nigh a landslip to notice. The Bosio public remains in

best work upon them is that of De Rossi (1864-77), which has established a chronological arrangement and shows the progress of Christian art as exhibited in the catacombs from the earliest period. The earliest and most simple mode of burial was to place a slab before the niche containing the body—the slab sometimes being a Pagan slab with Pagan symbols or inscription reversed—and to put upon it the name of the dead accompanied by some prayer or pious wish. In connection with some tombs vessels with the remains of a red fluid have been found. This was formerly supposed to be blood and to mark the resting-place of martyrs, but later opinions are that it was wine, sacramental or other. The early inscriptions were often half Pagan in character, but later symbols are more distinctly Christian. The vine, fish, anchor, dove, and olive branch were among the earliest, but later ornament was of a much more elaborate nature, and whole scenes and episodes from Scripture history were portrayed. The more elaborate tombs are all of a later date, when Christianity was no longer a persecuted religion. The catacombs of Paris—unlike those of Rome—were simply subterranean quarries, and were not excavated with any view of burial.

Catafalque (Ital. *catàfalco*, whence comes through the French the word *scaffold*), denotes a kind of scaffold or baldachin, erected (generally in a church) over a coffin and sometimes over a tomb, where it would remain for months. Some of these catafalques were very elaborate in design and ornamentation.

Catalani, ANGELICA, the daughter of a goldsmith at Sinigaglia, was born in 1782, and being sent to the convent of St. Lucia, near Rome, as a pupil, she soon attracted attention by her fine voice. Her father, under pressure of pecuniary embarrassment, allowed her to appear on the operatic stage at Venice when she was but fifteen. She then sang at various cities in Italy with great success, and about 1802 went to Lisbon, where she remained some five years, marrying M. Valabrègue, an attaché at the French embassy. In December, 1806, she sang for the first time in London in Portogallo's *Semiramide*, and the effect was marvellous. For seven years she was the idol of the English capital, and earned what was then an unprecedented fortune. In 1815 she was tempted by Louis XVIII. to take the management of the Italian Opera in Paris, but her policy of excluding all talent but her own was fatal to that enterprise, and in 1818 she began a series of European tours. Her magnificent voice, unrivalled for flexibility, compass, and power, had never been properly trained and had been used too early. In 1817 it began to show signs of deterioration, but still preserved its charm till 1824, the last four years being spent in England. She continued to sing on the Continent up to 1830, when she finally retired with her children to Florence, where she founded an academy for the musical education of girls. Madame Catalani's vocal gifts were not a little aided by her personal beauty, and by her sweet

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and generous disposition. Her liberality to the poor, to public charities, and to less prosperous members of her own profession, was unbounded. She died in Paris in 1849.

Catalonia (Sp. *Cataluña*), an old province of Spain and principality of the kingdom of Aragon, occupies the N.E. angle of the Peninsula, being bounded on the north by the Pyrenees, on the east by the Mediterranean, on the west by Aragon, and on the south by Valencia, and having an area of 12,483 square miles, with a coast-line of 240 miles. Much of the surface is occupied by offshoots of the Pyrenees, and the Sierra Llena cuts the district in two. The chief rivers are the Ebro, the Ter, and the Llobregat. Though the soil is light, the climate moist, hot, and variable, and the differences of altitude very great, vegetation is luxuriant, nuts, oranges, wine, figs, almonds, olive oil, cork, and esparto being exported largely. Meadows are rare, and therefore few cattle are reared, but numbers of sheep find pasturage on the mountains. Cereals are not sufficient for home consumption. The coast, though deficient in harbours, abounds with fish. The mineral resources are but imperfectly developed. There are manufactories of cotton, silk, and woollen goods, cordage, brandy, paper, and fire-arms. Barcelona, the capital, does a great trade with England, France, Italy, and the Spanish colonies, and distributes imports all over Spain. Catalonia is now divided into the provinces of Barcelona, Tarragona, Lerida, and Gerona. The chief towns are Tortosa, Gerona, Figueras, Lerida, Manresa, Rosas, Matara, and Tarragona, the three last being ports. The province, under the name of Hispania Tarraconensis, was the earliest Roman conquest in Spain. The Goths became its masters in the fifth century, and were succeeded by the Moors 300 years later. In 788 a dynasty of French counts under Charlemagne was established and soon became independent. By the marriage of Raymond with Petronilla of Aragon in 1137 the province was united to the latter kingdom. It was not till 1714 that, after many struggles, Catalonia was finally incorporated with Spain.

The inhabitants of Catalonia belong almost more to the Provençal (South French), than to the Castilian (Central Spanish), group of Latin peoples. They are of a vivacious, sanguine temperament, more refined and less cruel than the average Spaniard, although charged with a certain rough and even haughty bearing, due doubtless to the long enjoyment of civic rights and self-government. They are rather below the middle height (5 feet 4 or 5 inches), of bronze or swarthy complexion, with black, brown, or chestnut hair, bright deep-set eyes, large but not aquiline nose, broad prominent brow, and fine teeth. Their restless enterprising spirit, even at an early date, impelling them to distant voyages beyond the Strait of Gibraltar, is, so to say, recorded in the famous Catalan map of 1375, one of the oldest and best charts of the then known world preserved from mediæval times. Even still the Catalonians are great emigrants, not only to Madrid and other parts of the peninsula, but

also to Algeria and Spanish America. The vigorous and poetic Catalanian language stands quite apart from the other Spanish idioms, and betrays many direct relations with the Langue d'Oc of Southern France. It is current not only in Catalonia but throughout Valencia and the Balearic Isles, and in parts of Roussillon and Sardinia. Although now yielding to the standard Spanish, it is still the speech of about 3,000,000 inhabitants of the peninsula, forming the important Catalan section of the Spanish nation. Like Welsh, it has its periodical literature, religious publications, and "eisteddfods."

Catalpa, a genus of *Bignoniaceæ* including four or five species of trees, natives of China, Japan, North America, and the West Indies, which thrive in London and in the south of England, where protected from cold winds. They have large simple leaves in whorls of two or three, and showy terminal clusters of flowers. Both calyx and corolla are two-lipped; from one to three of the five stamens are sterile; the anther-lobes diverge; the fruit is a long cylindrical capsule; and the numerous seeds have broad fimbriate wings.

Catalysis is a term employed to denote a class of chemical actions which are induced by the presence of some substance—the catalytic agent—which does not itself, however, undergo any perceptible change. Many can be explained on the supposition of the formation and subsequent decomposition of intermediate products in which the catalytic agent takes part; but in many cases the exact nature of the influence exerted by the agent is not yet understood. Finely-divided powders, as platinum black, frequently condition catalytic actions, and the influence of acids in causing the inversion of cane sugar, or the conversion of starch into grape sugar, may also be referred to this class.

Catamaran (Hind. *kattu*, bind, and Tamil, *maram*, wood or timber), is a raft composed generally of three logs bound side by side, the middle one being longer than the others. The man using it kneels or squats upon it, and propels it by means of a paddle. The catamaran is used by the natives of the Madras coast, as it will go through surf where a boat would not live. A species in use in Brazil carries a sail.

Catamarca, a province of the Argentine Confederation in South America, the capital of which is San Fernando de Catamarca. It is separated by the Andes from Chili on the west, but on other sides is bounded by the provinces of Salta, Tucuman, Cordova, and Rioja, having an area of 35,780 square miles. The soil is fertile and produces cereals, cotton, and Chili pepper, besides affording pasturage to many cattle; but the mines of gold, silver, tin, nickel, and copper—especially the latter—are the chief source of wealth. The capital is somewhat south of the middle of the province, and is a tolerably well-built town, dating from 1685, when it took the place of Chacra, the old capital, now in ruins. It has churches, convents,

and schools, and is a centre for the distribution of imported goods, the exports being dried figs, wine, brandy, and cotton.

Catamenia. [MENSTRUATION.]

Catamount, a trappers' name for the Puma (q.v.).

Catania (anc. *Catana*), an ancient port on the east coast of Sicily, at the foot of Etna, and 30 miles north-west of Syracuse. Owing to its excellent harbour and charming situation the city has been thrice rebuilt after destruction by eruptions of Etna. Founded in 730 B.C. by Chalcidians from Naxos, it remained independent until taken by Hiero, and colonised by Syracusans. The original settlers returned, however, and were not finally driven out till the victory of Dionysius in 403 B.C. In the first Punic war Catania at once surrendered to Rome, and appears to have been faithful. It fell into the hands of the Goths and was rescued by Belisarius. The Saracens sacked the town, and the Normans raised it almost to its former pre-eminence. In 1169, 1669, and 1693 it suffered terribly from earthquakes and irruptions of lava. The streets are well paved and spacious and the private houses remarkably handsome, whilst few cities can boast finer public buildings. The cathedral, originally founded by Roger of Normandy (1094), the university (1445), and the town-hall, form the sides of a great square. Among many monasteries (now suppressed) the chief is San Nicolo, covering 21 acres, with a noble church and a famous organ. There are about 100 places of public worship, and many asylums, hospitals, and other institutions. It is the seat of a bishopric and the residence of the grand prior of the Order of Malta. A large trade is done in exporting sulphur, grain, fruits, macaroni, olive oil, and in manufacturing silk, linen, and ornaments. The harbour has been re-

Catania, THE city stands, has a breadth of La Trizza on the N runs up for a distance of the river Giaretta.

Catanzaro, the Calabria Ulteriore, 30 miles S.E. of built by Robert convents, a royal buildings. The chief silk goods, oil are here defended in 1515, but in 1783.

Cataract.

Cataract may be caused by injury, i.e. traumatic, the internal

Lamellar or laminar cataract is a curious variety in which the lens is not opaque throughout, but there is a turbid zone, enveloping a transparent central portion of lens, and enclosed by transparent lens substance. Diabetic cataract occurs in rare instances in the subjects of diabetes. Senile cataract is much the most common variety of cataract; it is rarely met with before middle life, and beyond the fact that it is probably the result of defective nutrition, little can be said with regard to its causation. The detection of senile cataract in the early stages of the disease is not so simple a matter as might be supposed. Since the invention of the ophthalmoscope the diagnosis has been greatly facilitated. The peripheral portions of the lens are usually the first to be involved, and the surgeon often finds it necessary, before pronouncing a confident opinion, to dilate the pupil with atropine, so as to bring the outlying parts of the lens into view. The pupils of old people always lose to a greater or less extent the blackness they originally possessed, hence it is not uncommon for patients to fear that they may be the subjects of cataract, when really no such thing is the case, and all that is required is a pair of glasses to remedy the defective vision. Again, loss of sight may result from disease of the fundus of the eye, the lens being perfectly clear. The confusion of cases of this kind with cataract is not possible if a careful ophthalmoscopic examination is made.

In the early stages of cataract improved vision often results for a time from the use of atropine; hence have arisen innumerable "cataract cures." The dilatation of the pupil so produced affords, however, only a temporary relief. There is no cure for cataract but by removal of the opaque lens. The old method of effecting such removal was by couching, i.e. forcibly dislodging the lens from its position in the line of vision and causing it to sink down into the vitreous humour. This plan is a rough and dangerous one, and is now completely discarded. The modern operations are of two kinds. In young subjects removal by *solution* is performed. A cataract needle is introduced and a small puncture made in the anterior capsule of the lens (the pupil having been previously widely dilated). The lens matter gradually protrudes through the wound, and becomes absorbed; a second or even third operation is often necessary before a perfect result is obtained. In older persons the opaque lens is hard, and cannot be dealt with by the method of solution; an *extraction* operation, therefore, becomes necessary. Before this can be effected the cataract must become mature, and this often, unfortunately, entails a delay of months or even years. In suitable cases, however, thanks to the improvements of the modern ophthalmic art, there are few surgical operations so satisfactory as those for cataract removal. The introduction of cocaine has led to the disuse of anaesthetics in the performance of the extraction, and in skilled hands it is a very rare occurrence for a failure to occur in an uncomplicated case. After removal of the lens it is always necessary for glasses to be worn, in order to replace the loss of refractive power, which absence of the lens

entails. Moreover accommodation [EYE] is also lost, so that glasses of different strengths have to be employed for near and for distant objects.

Catarrh (from the Greek words *kata*, down, and *rheo*, to flow) is a term applied to an inflammation of mucous membranes, accompanied by a running or discharge. Thus it is common to speak of nasal, pharyngeal, laryngeal, bronchial, gastric, intestinal, and vesical *catarrhs*. The word catarrh is, however, used in a more special sense to denote an inflammation affecting primarily the mucous membrane of the nasal cavities; this mucous surface is particularly exposed to sudden changes of temperature, and few persons pass through a winter in temperate climates without suffering from nasal catarrh, which thus comes to be spoken of as catarrh *par excellence*. Inasmuch, however, as nasal catarrh has a special designation allotted to it, viz. coryza, it seems inadvisable to limit the application of the word catarrh in this way. An important exciting cause of catarrhal inflammation is *cold*, either applied directly to the mucous surface involved, or resulting from exposure of the body generally to cold and damp, the effects of the "chill" manifesting themselves in one or other mucous surface. When once the tendency to catarrhal inflammation is set up in a particular mucous membrane, that part of the body is especially apt to become affected as the result of exposure. Thus in one person a cold "flies to the head," producing the ordinary nasal catarrh or coryza; in another person bronchitis results; in another laryngitis, and so on. In some cases the intestinal tract even may be affected by catarrh as the result of a chill.

The course of a catarrhal inflammation can be accurately studied in the Schneiderian membrane (as the mucous membrane of the nasal cavities is called) from its accessibility to inspection. In coryza or catarrh of this membrane there is seen to be redness and swelling. The nose feels stuffed up, not in the initial stage from excessive secretion, for the mucous surface is abnormally dry, but from mere tumefaction of the mucous lining; the contact of cool air or of any irritant readily provokes sneezing, showing the increased irritability of the inflamed and tender surface; there is a slight rise in the temperature of the body, accompanied by a feeling of chilliness, or by actual rigors, and the pulse is quickened. The dry swollen mucous membrane then commences to secrete an irritating fluid, at first thin and watery, then becoming viscid and yellowish; in other words the initial "serous" discharge subsequently takes on a "muco-purulent" or "purulent" character. The catarrh is seldom limited to the Schneiderian membrane, it often extends to the frontal sinuses, giving rise to a sense of weight and oppression over the eyes; or it passes along the lachrymal sac to the conjunctiva, causing conjunctivitis with the coursing of tears down the cheeks; or it may involve the pharynx, or be followed by an attack of bronchitis.

The majority of cases of simple nasal catarrh run their course in two or three days' time, and the particular plan of treatment the patient happens to

have adopted is, of course, credited with the cure of the disease. Hence the multitude of infallible specifics for a cold in the head. It is possible that a catarrh may be checked in suitable cases at the outset by promptly enforcing retirement to bed and inducing perspiration by administering some diaphoretic drug. Such cases are certainly few and far between. Much can be done, however, in the way of placing the patient under the most favourable conditions for facilitating the natural process of recovery. The very fact of catching cold implies that the general health is not what it should be, and trivial as the complaint usually is, it is most desirable that every effort should be made to prevent a simple malady from being converted into a serious one by mismanagement and neglect. Confinement to the house should be the first condition of treatment, and in most cases the patient had best go to bed; a mild aperient is usually beneficial. A tonic may be administered, and in the case of an adult a five-grain dose of Dover's powder taken at bed-time. Diet should be light in the initial stages, but as soon as the appetite begins to return, good feeding will help to hasten recovery. If the cold is not better after two or three days of such treatment, medical advice should be procured. The worst feature of the infallible cures is that they lead to the neglect of ordinary precautions. People are naturally unwilling to lie up, and yet they feel that they ought to do something, so they go through the day's work in the ordinary way, and take from time to time a sip of something or other to soothe their consciences. This is a mistake; if a cold is worth treating at all, it is worth lying up for, and if a man succeeds in rapidly throwing off a cold without giving up his ordinary work, it redounds to the credit of his constitution rather than to that of some vaunted specific. The plan of starving a cold and that of reducing liquids to a minimum in the hope of cutting short the discharge are both unpleasant forms of treatment, and it is very doubtful whether they ever do good. Certainly in all but the mildest forms of catarrh they are productive of harm.

Catarrhini, a name for the Old World monkeys, and therefore equivalent to the modern family Simiidae. [ANTHROPOID APE, APE, BABOON, MONKEY.]

Catawbas, an historical nation of North America, formerly widespread throughout the present states of Virginia and both Carolinas. By some writers they have been identified with the Eries, or so-called "Neutral Nation," who were partly destroyed, partly driven southwards from their settlements about the Niagara river by the Iroquois in 1656. But the Catawbas appear to have been really a branch of the great Muscogee family of Alabama and Florida. They are now extinct or else absorbed in the Chickasaws and Choctaws of Indian territory; but their name survives in the geographical nomenclature of their former domain, as in Catawba county, N. Carolina, and the Great and Little Catawba rivers, which flow from the Black Dome (Alleghanies) through the Wateree to the Santee.

Catechu, or *Shan-shoo*, is a large, employed in medicine to some extent in medicine, what several of the Chinese call *cutch*. In pharmacology, *japonica* heart was and then. It is dark. The pulp, or *ganther*, the *rubiac* adjoining less. **Catechu** is a extract and to from *Pegu* European *terra* dark red tree, evaporation. brittle. pharmacy, from *acida*, and yellow, fracture. consist

Categories, or HEADS OF PREDICABLES (Gr. *kategororcin*, to accuse, hence to state), the heads under which all logical terms and all objects of knowledge have been arranged by philosophers. Aristotle considered knowledge and existence under the heads of Being, Quantity, Quality, Relation, Place, Time, Position, State or Condition (*habitus*), Action, Passion. These heads have been much discussed, criticised, and modified. The Stoics considered Being under the heads of substance, quality, and relation. Trendelenburg, who looked upon Aristotle's categories as in some measure corresponding with the parts of speech, considered Being as motion under the conditions of time and space and as divisible under what he called mathematical and real categories. Kant's categories (twelve in number) are the leading types of concept implied in the judgments of which all our knowledge consists—including unity and plurality, substance and cause, etc.—the forms of thought without which knowledge could not subsist: while Hegel's are the concepts successively posted by Absolute Thought in the construction of the Universe, and also by human thought in the history of the race and the individual. J. S. Mill classed

possible knowledge quite differently from Aristotle, and in a way hardly consistent with his own Idealism. He makes four classes: (1) States of consciousness or feelings; (2) the mind which feels; (3) external objects which excite feelings; (4) relations between feelings. Spencer (*First Principles*) points out how reasoning often consists in bringing phenomena under an ever-widening circle of other phenomena.

Catenary (Lat. *catena*, a chain) is the curve taken up by a chain when supported at its ends. The ordinary catenary in mathematics would be the shape assumed if the chain were perfectly flexible, inextensible, and of uniform character throughout; *i.e.* any inch length having the same mass. This special curve is, therefore, chiefly of theoretical interest, as it never occurs in practice. If the weight of the chain is distributed so that equally-spaced vertical lines intercept equal weights of the chain, the curve is parabolic. [PARABOLA.] Thus the lowest part of an ordinary catenary is parabolic, and in all cases where we have a nearly flat catenary, as with telegraph-wires, we may advantageously assume that the curve is parabolic. Also it follows that in the case of a suspension bridge, where a uniform roadway is supported by vertical rods at equal intervals, the chains from which it hangs will assume the parabolic form, instantly disturbed, however, by the local addition of any load to the roadway. The stress at the supports of a catenary of given length becomes greater as the supports are taken farther apart. Hence the objection to making telegraph wires too taut.

Caterpillar, the name of the first of the three stages of the life of an insect after its emergence from the egg. The caterpillars of the Lepidoptera (butterflies and moths) are the best known, and most typical. They are generally elongated and worm-like: the body is not definitely divided into three regions, as in the adult. There are no wings, but the rudiments of these can be found in some cases. The caterpillar crawls by means of a series of short jointed legs placed along the sides of its body; as these have no relation to the legs of the adult they are known as "prolegs." The structures that develop into the legs of the adult insect or imago are three pairs of processes at the anterior end of the body: by means of these the caterpillar guides its food to its mouth, which has rather powerful jaws. The caterpillars of Lepidoptera are very various in form and colour: they are often provided with bristles or various processes, and often gain other protection from the fact of their colour and ornamentation resembling those of their environment. Caterpillars occur in other orders of Insects, but are often known by other names, such as the "maggots" of flies.

Catesby, MARK, born about 1680, became an ardent student of natural history, and in 1712 went to Virginia, where he made a fine collection. In 1719 he returned, and acquired the friendship of Sir Hans Sloane, who persuaded him to visit Carolina. He accordingly spent four years in that province, in Georgia, Florida, and the Bahamas.

often amongst the native Indian tribes. He was a skilful artist, and in 1731 he began to publish his *Natural History of Carolina, Florida, and the Bahama Islands*, the greatest work of the kind produced in England up to that date. He also wrote *Hortus Britannus-Americanus*, and died in London in 1749.

Catesby, ROBERT, was born about 1570 of an English Catholic family, whose property was in Northamptonshire and Warwickshire, and who were descended from Richard III.'s minister. In Elizabeth's reign his fanatical zeal had led him into various conspiracies, and on the accession of James the increased severity of the penal laws against Papists caused him to form the project in 1604 of destroying by gunpowder the king and the parliament. He communicated this design to John Wright, and Thomas and Robert Winter. Guido Fawkes or Guy Faux was then taken into their confidence, and next Thomas Percy, of the Northumberland family, with eleven others joined in the plot, for the details of which see FAWKES. On the detection of the conspiracy Catesby rode into Warwickshire (November, 1605), and was killed whilst resisting the officers sent to arrest him.

Cat-fish, a name often given to *Anarrhichas lupus*, of the Blenny family, and sometimes called sea-cat, sea-wolf, or wolf-fish. It is a northern fish, more than six feet long, with strong teeth fitted to crush the crustaceans and molluscs on which it feeds. Two other species occur in the North Pacific. The name is also applied to the species of the Physostomous family Siluridæ. [BLENNY, SILUROIDS.]

Catgut, from *kit-gut*, *i.e.* gut used for kit or fiddle-strings, is the name employed for strings for musical instruments, manufactured from the intestines of sheep, horses, mules, and other animals. They are scraped, steeped in alkali, sometimes bleached, and twisted into the forms required. The best catguts—called "Roman strings"—come from Italy. Catgut is also used for clocks, bow-strings, whiplcord, and other purposes. Much of that prepared from horses and mules is manufactured in France.

Cathari, a name given to a sect of heretics, otherwise called Gnostics. The word means "Puritans," and the sect, which professed to base itself upon the New Testament and certain apocryphal scriptures, aimed at a pure and ascetic life. They existed at Turin from 1035 till the fourteenth century, and under the name of Albigenses they attained some importance in Southern France. They finally disappeared under the kindly attentions of the Inquisition during the fourteenth century.

Catharine, SAINT, of Alexandria, virgin and martyr, whose day is celebrated on November 25, is alleged to have been of royal descent. She was tortured on the wheel that bears her name, and put to death for her profession of Christian faith in 307 A.D.

Catharine's, St., is an island about 12 miles off the port of Riceborough, in Georgia, U.S.A. It

is 10 miles long by five miles broad, and is formed by the alluvial deposits of the rivers Newport and Medway.

Catharine Parr. [HENRY VIII.]

Catharine of Aragon, the daughter of Ferdinand and Isabella of Spain, was born in 1483. At the age of eighteen she was married to Arthur, the eldest son of Henry VII. of England, who died five months later. In 1502, for the sake of securing her dowry, Prince Henry, Arthur's brother, was made her husband, though he was six years her junior, but the marriage was not solemnised until after his succession to the throne in 1509. In 1516 she gave birth to Mary, who afterwards became queen, and in 1527 Henry, hearing that there was little prospect of male issue, and being enamoured of Anne Boleyn, professed that his conscience was awakened to the sin of having married his brother's wife, and sought for a divorce. Wolsey seconded the king's efforts in the hope of arranging an alliance with France, but the Pope and Charles V., Catharine's brother, resisted his schemes. In 1533 Henry, having privately married Anne Boleyn, convened an ecclesiastical court in London, over which Cranmer presided, and the decree of divorce was pronounced. Catharine, under the title of Dowager-Princess of Wales, retired to Kimbolton Castle, in Huntingdonshire, where she died brokenhearted in January, 1536. She was a devoted and faithful wife to the king, a good mother, and a pious, amiable woman. Her character and the events that led to her ruin and death have been made familiar to all by the play of *Henry VIII.*, which bears Shakespeare's name.

Catharine of Braganza the daughter of John, Duke of Braganza and afterwards King of Portugal, was born in 1638. Before the Restoration she had been arranged for marriage with Charles II. of England, and the wedding was celebrated at Plymouth. She brought as dowry half-a-million of money, and the towns of Tangier and Bombay. She was of tact, combination, and Roman Catholicism, married to a Protestant, and her husband's death bore her trials in England very heavily. Returning to Portugal, she succeeded her brother, Don Pedro, in 1683.

Catharine of France the daughter of Louis XIV. and Marie Madeleine de France, was born in 1691. She was the second daughter of the king, and in 1711 she was married to the Dauphin, the future Louis XVI. She was a pious and virtuous woman, and her husband's death bore her trials in France very heavily. She died in 1744.

and unscrupulous character now asserted itself. France was torn by the struggle between the Catholics, headed by the House of Guise, and the Huguenots, with Coligny and the Prince de Condé as their chiefs. For a time she openly adopted the neutral policy recommended by Michel l'Hôpital, but her real aim was only to secure her own position by playing off one party against the other. A Catholic at heart, she was resolved never to allow the Protestants to prevail. The Italian arts of lying, dissimulation, assassination, and licentiousness were freely exercised by her and by her agents to effect her purposes. When the Duke of Guise had defeated Condé at Dreux (1562) and Orléans (1563) and become a person of commanding power, he perished by the hand of a zealot. Coligny's return to favour with the young monarch, after the peace of St. Germain in 1570, stimulated Catharine to plan the massacre of St. Bartholomew two years later. Her fear of the revival of the Protestant cause, and her jealousy for her favourite son, Henry III., are believed to have led her to connive at the death of the Duc d'Alençon. The succession of Henry did not restore her influence so completely as she had hoped, and the debauched and degraded king was as ready as his mother to rid himself of a dangerous rival by the murder of the Duc de Guise in 1588, and by the use of Henry of Navarre to break up the League. Catharine had given her daughter, Marguérite de Valois, in marriage to the latter prince in accordance with her scheme for hoodwinking the Huguenots, and extending her personal sphere of action; but the result was disappointing, for Marguérite, though as little bound by moral law as her mother, proved a less skilful and less ambitious intriguer. Catharine did not live to witness the extinction of the House of Valois by the assassination of Henry III., for she died a few months before that event, in 1589. Her one redeeming feature was her love for literature and art. She built the Château de Monceaux and other noble edifices, and she planned and began the palace of the Tuileries.

Catharine of Siena, SAINT, was born in 1347, being the daughter of a dyer. At the age of 20 she joined the Dominican sisterhood, having early displayed a tendency towards severe asceticism, and having been favoured with beatific visions, in one of which, rivalling St. Francis, she received the *stigmata*, or marks of the wounds of Christ. The Franciscans treated this infringement of their monopoly by the Dominicans with great indignation, and Pope Sixtus IV. forbade the propagation of Catharine's story, but it held its own the more successfully, perhaps, because of opposition. In 1376 she went to Avignon to persuade Gregory XI. to return to Rome. He did actually return, and accidentally died there, a fact which greatly enhanced her reputation. In the schism between Urban VI. and Clement VII. she very actively supported the former, but worn out by self-inflicted sufferings, she died in 1380. She left some literary remains which are of interest, owing to the period in which she lived, but hardly, perhaps, deserve all the praise lavished on them by devout admirers.

Catharine of Valois, the daughter of Charles VI. of France, was born at Paris in 1401, and after the invasion of France and the treaty of Troyes in 1420, was given to Henry V. of England, together with large territorial possessions, and the regency of France. Two years later her husband died, but not before the birth of a prince destined to succeed as Henry VI. She then contracted a secret marriage with Owen Tudor, a man of high physical and moral qualities, but immeasurably below her in rank. After some years her mésalliance was made known, and involved her in troubles that probably hastened her death in 1437. She left three sons, the eldest of whom married Margaret Beaufort, and became the father of Henry VII., the founder of the Tudor dynasty.

Cathartics, remedies employed to produce increased glandular secretion into the intestine with augmented peristaltic action. They set up an artificial catarrh (q.v.) of the intestinal mucous membrane, and, as the derivation of the word cathartic implies (from *kathairo*, I cleanse), are administered with a view to removing deleterious substances from the alimentary canal. Hydragogue cathartics are those which produce very watery evacuations. The principal drugs belonging to the group are mercurials, scammony, jalap, elaterium, and colocynth.

Cathay, the name by which China was known to mediæval geographers, and which it still bears (*Kitai*) in Russia and Central Asia. It was derived from the Khitan race or dynasty that for some two centuries maintained its independence in the northern provinces, disappearing in 1123 before the Manchus. The word, however, survived, and was imported into Europe, when the conquests of Jenghiz in the thirteenth century attracted notice to Chinese affairs. This primitive dynasty, known in Chinese history as Liao or "Iron," was displaced after two centuries by the Manchus, who, under the name of Nyûché or Chûrché, formed the Kiu or "Golden" age of China, and were extinguished by the Mongols. According to early travellers, the Khitai or Cathayans were beardless like the Mongols, but less broad in feature, small in stature, with narrow eyes, kindly, even polished, and excelling as artists and craftsmen. Their language and their written characters seem to have been identical with Chinese, and they were skilled in the manufacture of silken tissues. Their country was generally represented as lying north of China proper, and Zipanga or Japan was regarded as an outlying island, Cambaluc being mentioned as the capital. It was not until the beginning of the seventeenth century that Benedict Goës discovered Cathay and China to be identical, and the name soon afterwards dropped out of use.

Cathcart, SIR GEORGE, K.C.B., was born in London in 1794, being the third son of Earl Cathcart, a distinguished general and diplomatist. Educated at Eton and Edinburgh, he entered the army in 1810, and accompanied his father, then ambassador at St. Petersburg, as his aide-de-camp. He served with the Russian army throughout the

German campaign of 1813, and the advance Paris in 1814. Going to the Congress of Vienna he became attached to Wellington's staff, and was present at Quatre-Bras and Waterloo, and at the occupation of Paris. His duties called him to Nova Scotia, Bermuda, and Jamaica, between 1828 and 1834, when he went on half-pay. In 1837 he commanded the King's Dragoon Guards during the Canadian rebellion, and remained in that country until 1844. He was next appointed deputy-lieutenant of the Tower, but in 1852 was sent out as governor and commander-in-chief to the Cape, where he brought the Kaffir war to a successful issue. In 1854 he received command of a division in the Crimea, and great things were expected of him, but he fell at the battle of Inkermann on November 5 of that year.

Cathedral, the chief church of a district or diocese, so called as containing the bishop's throne. The cathedral is managed by the dean and chapter, the chapter consisting of canons, and this body has the right of electing the bishop forced upon them by the Crown. The canons are of old or new foundation, the latter term being applied to those whose origin dates from monastic bodies changed at the Reformation. Canons are appointed either by the bishop, in which case they are said to be collated, or by the Crown, which appoints by letters patent. Sometimes the Crown holds a prebend, as is the case at St. David's in Britain and has also been the case in France and in Germany. Generally a cathedral town has the dignity of being a city, but this is not always the case, as was decided by law with regard to Manchester. In the case of a town possessing more than one cathedral, only one possesses full cathedral rights. At one period any mother church of a district was called a cathedral, and though not being the see of a bishop, it yet possessed a certain *ex cathedrâ* authority.

Cathelineau, JACQUES, was born in 1758, and exercised the trade of a weaver at Pin-en-Mauges, when in 1793 an insurrection broke out amongst the young men who had been drawn for the conscription. Though as a married man he was not liable to serve, he put himself at the head of the movement. His success in attacking several republican posts led to his speedy promotion to the supreme command of the Vendean forces. He ventured to make an assault on Nantes (June 29, 1793), but was repulsed and killed. His courage, honesty, and simplicity caused him to be venerated by the royalist peasants, who called him "The Saint of Anjou."

Catherine I., EMPRESS OF RUSSIA, was born of humble parentage at Marienburg in Livonia, about 1688. Little is known for certain of her early life, but she married a Swedish dragoon in 1701, and next year was carried off to Moscow as a prisoner by the Russians, and never saw her husband again. She appears to have been the mistress first of General Bauer, and then of Prince Menschikoff, but in 1704 her remarkable beauty captivated the Czar, Peter the Great, who lived with her until 1711, when he made her his legitimate wife. She accompanied him in his campaign against Turkey,

and arranged a treaty with the Grand Vizier that rescued the Russian army from a position of great peril. In 1724 she was crowned Empress, and next year, on the death of the Czar, Menshikoff caused her to be proclaimed his successor. She was a mere tool in his hands, taking little interest in affairs of state, and being addicted to intemperance, from the effects of which she died in 1727. She had many daughters, but only three survived their father, and one of these became the Empress Elizabeth.

Catherine II., the celebrated Empress of Russia, was the daughter of the Prince of Anhalt-Zerbst, and was born at Stettin in 1729. Her names of Sophia Augusta were changed to Catherine Alexievna when she married Peter, nephew of the Empress Elizabeth, in 1745. He was a hideous, empty-headed, debauched young man, with a few good qualities, however, but he was soon detested and despised by his clever, intriguing wife, who spent the early years of their marriage in study and seclusion. Presently she became infected by the corruption of the court, and her conduct with Soltykoff, Narischkine, and Poniatowski, afterwards King of Poland, gave rise to grave suspicions. In 1762 her husband mounted the throne as Peter III., but was speedily forced to abdicate by an insurrectionary movement at which Catherine connived. A few days later he was strangled in the castle of Robocha by Alexis Orloff, one of her favourites, and she was crowned Empress at Moscow. Her life henceforth was stained by gross profligacy and unbounded cruelty, but she was a vigorous and able sovereign, promoting agriculture and commerce, encouraging literature and science, and losing no opportunity for enlarging the empire. She corresponded with Turgot, D'Alembert, Euler, and Voltaire, and she carried out her own hand a scheme for the conquest of the Crimea. She annexed Courland, and took the place of the several successful and other provisions of the set Poniatowski, and of Poland, and was partitioned of that Volhynia and Poland part in the revolution she died of apoplexy by her degeneration biography written in 1852.

Catheter, an instrument, or a thing, employed for introducing into the bladder or air. The catheter is a tube, or a catheter, through the urethra, the bladder, and drawn out, and is used for the nature of the catheter are not combined. Thus, in the

former case the form of the instrument is adapted to the course taken by the urethra. Thus a silver male catheter is a hollow rod of silver of about ten inches in length, and curved at the extremity which is designed to be inserted into the bladder. A female catheter is much shorter than this, corresponding to the different length of the female urethra. Flexible catheters are usually furnished with a *stilet*, i.e. a wire which can be passed along their length, and which can be bent so as to give them any particular shape which may be desired. Catheters are made of different sizes, varying from the No. 1 instrument, which will pass through a very constricted orifice, to the largest size, No. 12. A special form of catheter with a bolder curve is used in cases of retention of urine due to enlargement of the prostate gland, and is known as the prostatic catheter. The Eustachian catheter is introduced through the nose into the Eustachian tube, in order to admit of air being forced into that canal, in certain cases of ear disease. The instrument is a small curved catheter, some six inches in length.

Cathetometer is an instrument employed in physical research to measure accurately the distance between two points in a vertical line. Thus the volume of gas enclosed in a vertical graduated tube may be read at a distance from the tube by means of a cathetometer. In such a case it may be undesirable to approach closely to the tube, as the heat of the body of the observer may alter the volume required to be measured. The instrument is essentially a horizontal astronomical telescope capable of sliding up and down a graduated vertical scale. This telescope is first placed so that its axis points to one end of the required length, two fine spider-lines fitted at right angles to each other in the telescope helping to effect this adjustment accurately. The position of the telescope is read off on the vertical scale of the instrument and the telescope is then moved up or down till its axis points to the other end of the required length. Then its new position is again read off. The distance traversed by the telescope is the distance between the two ends of the required length, which is therefore determined.

Catholic Church, a somewhat vague and elastic term. Strictly it implies the whole or universal church, and is used sometimes to denote the whole body of Christian believers, at other times to denote those who take as authoritative the first four general councils, and again, especially in England, to denote the Roman Catholic Church, i.e. those who accept the authority and doctrine of the Pope. Hence we have the anomaly of people who recite their belief in the Catholic Church in their creed, and yet repudiate the name of Catholic. If the definition of Catholic belief, put forth in 434, *quod semper, quod ubique, quod ab omnibus*, be taken as the test of the Church Catholic, its limits must now be very contracted. However, most churches now only declare themselves branches of the Catholic Church, and admit that other churches may have an equal right to the name. [ROMAN CATHOLIC CHURCH.]

Catholic Emancipation. After the Reformation in England it was felony for a foreign priest, and high treason for a native one, to perform the rites of his religion in this realm. A Catholic could not acquire lands by purchase, and was subject to many other disabilities in exercising the rights of a citizen. Some relief from this state of things was given by Sir George Saville's Test Act in 1778, but it was received with great disfavour by the country at large, and was made the occasion of the Gordon Riots. In 1791 further relief was granted in England, and in 1792 and 1793 in Ireland, but in 1800 Pitt was unable to fulfil his promise of further relief to Irish Catholics, owing to the king's attitude of *non possumus*. In 1829 the country was ripe for the repeal of obnoxious acts, and Sir Robert Peel's Bill for this purpose received the Royal Assent in April. This did away with almost all disabilities, and the same path, in spite of an occasional check, has since been pursued. The last right given was that the Irish Lord Chancellorship may be held by a Catholic, but there are still some English offices for which Catholics are ineligible. Sir M. A. Shee was the first Catholic judge elevated to the English Bench since the beginning of the 18th century.

Catiline, or LUCIUS SERGIUS CATILINA, came of high patrician lineage, and in early life attained unenviable fame by his bloodthirsty zeal in carrying out Sulla's proscriptions, and by his reckless profligacy, which did not respect even the Vestal Virgins. In 66 B.C. he aspired to the consulship, but was impeached by P. Clodius Pulcher for extortion during his government in Africa. Thereupon he formed a conspiracy, in which Crassus and Cæsar were suspected of complicity, for murdering the consuls and all opponents, and for seizing supreme power. The plan collapsed, but by dint of bribery Catiline was acquitted in the trial for extortion, and again became a candidate for the consulship, having extended and strengthened his plot in the meanwhile. Cicero, by his denunciations, foiled this scheme, and with M. Autronius was elected for the year 63. Informed by Fulvia, Catiline's mistress, of all that was passing in the secret conferences of the conspirators, the new consul succeeded in thoroughly alarming the senate, but really produced no evidence in support of his charges save the statements of Allobrogian envoys, with whom the conspirators had been in correspondence. On the strength of these reports Lentulus, Cethegus, and Statilius were seized and put to death, though Cæsar protested against the proceedings as illegal, while Cato as strenuously upheld them. Catiline escaped to his army, but his half-organised forces were unable to cope with the legions under the nominal command of C. Antonius. He was defeated and killed at Fæsulæ in 62. What we know of his character and policy is derived mainly from his opponents, whose assertions must be received with caution. However worthless he may have been personally, he undoubtedly represented the popular party in its struggle against the aristocracy of Rome, and his parallel may perhaps be found in such restless spirits as the Duc d'Orléans (Égalité), and

similar intriguers of the French revolutionary period.

Catkin, a term originally applied to the elongated pendulous male inflorescence of sessile flowers, individually inconspicuous, in the hazel, which, after the discharge of its pollen, falls off entire. The arrangement of the sessile flowers is such that in some cases the inflorescence is simple, in others compound. Typically each catkin-scale or bract has a flower in its axil with two bracteoles, these bracteoles having also flowers in their axils with secondary bracteoles; but the type is departed from by the absence either of the central or the lateral flowers, or of some of the bracteoles. The term has been extended to inflorescences, like those of the Spanish chestnut, which include some bisexual flowers; to those in the willows, which are erect instead of pendulous, female as well as male, and which, when the former, are not deciduous; or to those of the birch, which fall to pieces instead of coming off entire. The Latin term for a catkin, *amentum*, gives the name *Amentaceæ* to a group of trees bearing catkins.

Catlin, GEORGE, was born at Wilkesbarre, Pennsylvania, U.S.A., in 1796. He was educated for the law, but being a skilful painter took to art as a profession. In 1832 he resolved to make a thorough study of the American Indians, who were fast disappearing before the advance of civilisation. He spent several years among the various tribes, both of North and South America, and in 1840 exhibited his pictures in London, where next year he published his great work, *The Manners, Customs, and Conditions of the North American Indians*. In 1844 appeared his *North American Portfolio*, and in 1848 an account of the adventures of the red men whom he had brought over with him to Europe. Finally, in 1868 he printed his *Last Rambles among the Indians of the Rocky Mountains and the Andes*. He died in Jersey city in 1872.

Cato, MARCUS PORCIUS, often spoken of as CATO MAJOR, to distinguish him from his great-grandson, and known also as Censor, Priscus, and Sapiens, was born at Tusculum in 234 B.C. He came of a good old plebeian stock, and was trained to agriculture and to military service. He fought under Fabius against Hannibal at Tarentum (209) and distinguished himself at the battle of the Metaurus (207). In the intervals of war he so lived on his farm, once the property of Curius Dentatus, as to earn from his neighbours the nickname of the Wise. L. Valerius Flaccus induced him to migrate to Rome, where he was elected successively quæstor (204), ædile (199), prætor (198), and consul (195). In 202 he took part in the final defeat of Hannibal, at Zama, and in 194 he gained a triumph for the subjection of Spain. Three years later he co-operated, as military tribune, with M. Acilius Glabrio in crushing Antiochus, and wresting Greece from the domination of the East. He now devoted himself to civil affairs, and to a noble, if rather narrow-minded, struggle against the changes in character, manners, and religion that the extension of the empire was quickly bringing about. He fearlessly assailed the weak points in the careers of

such successful soldiers as Acilius Glabrio, Fulvius Nobilior, and Minucius Thermus, and stimulated the prosecution of the two Scipios. Elected censor in 184, he made unflinching use of his power in weeding out from the ranks of the senators and knights all who did not come up to his high standard of honour and duty, not scrupling to strike out so eminent a personage as L. Quinctius Flamininus. He advocated minute sumptuary legislation, opposed the spread of luxury amongst women as well as men, and denounced the introduction of licentious rites. He acted up to his principles with rigid consistency. His life and his household were regulated in every detail, and even his wife held a position little better than that of a slave. It must not be supposed that his attacks on the rising generation provoked no retaliation. He had to bear many hard blows in return, and at the age of 81 was forced to defend himself against a capital charge. Sturdy to the last, one of his final public acts was to urge his countrymen into the third Punic war with the famous cry "Delenda est Carthago!" and almost immediately before his death in 149 B.C. he appeared to prosecute Sergius Galba for his treacherous slaughter of the Lusitanians. Of his 150 collected speeches none remain, but his treatise *De Re Rusticâ* contains valuable information, and the fragments of his *Origines* supply a few details as to Roman history. His *Apophthegmata* have wholly perished. Notwithstanding his hatred of everything foreign, he learned Greek at the age of 80.

[illegible]

faction. To his utter disgust the cause was abandoned without a struggle in Italy, but he followed his nominal chief to Epirus, though he was not present at the battle of Pharsalia. When Pompeius threw over his party, Cato, with a small remnant of true republicans, crossed to Africa, marched heroically through the Libyan deserts and shut himself up in Utica. He might have surrendered on terms honourable to himself, but he feared lest his followers should suffer. He held the town until they had escaped by sea, and then, retiring to his couch, stabbed himself in 46 B.C. His life was wasted so far as contemporary history was concerned, but he became to future generations a kind of patron saint of Stoicism. Yet there was nothing saintly about him. His philosophy was pure self-regard—not, it is true, of a mean and ignoble description, but of a nature that, despite the professions it made to the contrary, practically excluded all sympathy with fellow mortals and all communion with God.

Cato Street Conspiracy, an insignificant plot to assassinate Lord Castlereagh and other ministers in 1820, and so called from the fact of the conspirators meeting at Cato Street (now John Street) in the Edgware Road. One of the gang betrayed the plot to the police, and Thistlewood and four others were hanged, while five were condemned to transportation.

Catrail, THE, a remarkable earthwork which begins at the river Gala, about a mile from Gala-shiels, and extends to Peel Fell, Northumberland, a distance of 50 miles. It is also known as "The Devil's Dyke" and "The Picts' Work Ditch." Consisting of an excavation, with a wall or bank on either side formed of the excavated materials, it resembles similar Keltic works in various parts of the kingdom. Various theories have been propounded as to its origin, since attention was first called to its existence by Gordon's *Itinerarium Septentrionale* in 1726.

Cats, JACOB, born at Brouwershaven in Zealand in 1577, studied with distinction at the University of Leyden, and having spent some time in France and Italy to learn the language, settled as an advocate at the Hague. A severe attack of tertian fever drove him to seek a change in England, where he learned the language, but did not recover his health. At last, on his return home, a wandering quack gave him a remedy. He now married and settled at Middleburg, devoting himself to farming and poetry. He produced *The Emblems of Fancy and Love, Galatea*, a pastoral romance, *The Mirror of Past and Present*, and *Marriage*, with other works. His simple, flowing style, his genial wisdom and fund of maxims and humorous illustrations, at once gained him popular favour. "Father Cats" is still venerated in Holland, but his antiquated diction prevents his being read. In 1621 his quiet pastoral life was broken up by the opening of the dykes, but he was provided for by a magistracy, and ultimately rose to be Grand Pensionary of Holland. He visited England twice as a political envoy, and was knighted by Charles I. His later works comprise *The Nuptial Ring*,

Eighty-Two Years of My Life, Old Age and Country Life, Coffins for the Living, etc. He died in 1660, and was buried with great honour in the Kloosterkerk at the Hague.

Catseye, a variety of quartz containing fibres of some asbestiform mineral, so that when cut *en cabochon*, i.e. with a rounded or oval surface, it exhibits a moving beam of internally reflected light, as does a cat's eye, whence this property is called *chatoyance*. Catseyes are generally grey or bluish, and form gems of some value: but the African catseye occurs abundantly in the Asbestos mountains of Griqualand. It is quartz penetrated by fibres of crocidolite, a greenish asbestos, which is often altered into limonite or hydrous iron oxide so as to produce a beautiful golden-brown catseye. This has of late been largely imported, and unfortunately artificially coloured. It is largely used for the handles of parasols and canes.

Catskill Mountains, celebrated as the scene of Rip Van Winkle's prolonged slumbers, are situated in New York state. They are for the most part steep, reaching an altitude sometimes of about 4,000 ft., and covering an area of about 5,000 square miles. They belong to the Appalachian range.

Cattaro, a seaport and town of Austria in the Crown land of Dalmatia, is situated on the Gulf of the same name, which is an inlet of the Adriatic. It formerly belonged to the republic of Venice, but came under the sway of Austria by the treaty of Vienna, 1814. Its chief feature is its cathedral.

Cattegat, a bay of that portion of the North Sea between Sweden and Jutland, communicates with the Baltic by the channels of the Sound and the Great and Little Belts (q.v.), and with the German Ocean by the Skager Rack. Its length is 150 miles, its breadth 85 miles, and though in some parts it reaches a depth of 36 fathoms, it has many sandbanks, and on account of the storms to which it is subject is perilous to shipping.

Cattermole, GEORGE, artist, was born in 1800, at Dickleborough, Norfolk. Engaged at an early age to a topographical draftsman, he worked on Britton's *English Cathedrals*, and illustrated the *Waverley Novels*. He also illustrated the *Historical Annual*, a work by his brother, the Rev. C. Cattermole. Elected as member of the water-colour society in 1833, he contributed to its exhibitions his finest works in this department of art. In 1855 he gained a first-class gold medal at Paris, and in 1863, having meanwhile taken to oils, he exhibited *A Terrible Secret* at the Royal Academy. He died in 1868 at Clapham Common.

Catting is the operation of drawing a ship's anchor perpendicularly up to the cat-head, or, where there is no cat-head, of placing the anchor at rest in its berth on board. In large ships catting is now usually performed with the assistance of a strong davit, to which suitable tackle is affixed. The cat-heads are two stout and short beams of timber projecting nearly horizontally from a ship's bow, one on each side.

Cattle (the same word as *capital*, i.e. wealth, and another form of *chattel*), a term formerly

used to denote property in general, hence transferred to cows and oxen, which constituted the chief wealth in pastoral times. It is an agricultural rather than a zoological term; and the different breeds known to English farmers, with some others on the Continent of Europe, are all forms of the domestic ox (*Bos taurus*). Those with which we are chiefly concerned—the breeds of the United Kingdom—are usually reckoned to be fourteen in number (Shorthorns, Herefords, Devons, Sussex, Norfolk Red Polled, Longhorns, Welsh, Black Galloways, Kerrys, Polled Aberdeen-Angus, West Highland, Ayrshire, Jerseys, and Guernseys). These forms differ greatly in size, shape, and colour, as will be seen in the detailed description of each breed. This diversity is due to four factors:—(1) The mixed origin of the present breeds; (2) the tendency of animals to vary under domestication (q.v.); (3) the fancy of breeders for perpetuating any given variation; and (4) the effect of environment (q.v.). The period at which cattle were first domesticated must be very remote, as they are mentioned in the earliest writings of which we have any knowledge, and their bones have been discovered in dwellings dating back to Neolithic times. It is generally supposed by naturalists that the European breeds—our own included—are descended from three distinct forms—*Bos primigenius*, *B. frontosus*, and *B. longifrons*. To these some systematists give specific rank, but Lyddeker and Nicholson consider *B. primigenius* to have been only a variety of *B. taurus*, and the last two mere stunted races, from which it is probable that the small cattle of Wales and Scotland are derived. The first, mentioned by Cæsar as the *Urus* (q.v.), though practically extinct, has left some descendants not greatly altered, except in size, from the original type. These live in a half-wild state in herds in Chillingham Park, Northumberland, and at Cadzow, near Hamilton, Lanarkshire, while much smaller herds exist at some other places, and at least one herd has died out within living memory. They are white in colour, with black rims round the eyes, the muzzle, hoofs, and tips of the horns black, the inside of the ears reddish-brown, and the flanks and shoulders shaded with grey. Other descendants are still to be found in Hungary, Spain, and Italy, but these differ more widely from the parent form.

1. *Shorthorns* are the most numerous, most widely distributed, and most important of all the native breeds. They originated in the north of England, and were first bred systematically by the brothers Colling, of Barmpton and Ketton, Durham, who profited by the experience of Mr. Bakewell, of Dishley, Leicester, to whom the improvement in Longhorns is due. The first public sale of cattle of this breed by the Collings took place in 1810, when the bull "Comet" fetched £1,050. During their lifetime Mr. Bates, of Kirklevington, and Mr. Booth, of Warlaby, also bred Shorthorns, and from their stock are descended two strains known respectively as "Bates" and "Booth" Shorthorns. The general outline is square, the coat mossy, the muzzle and skin round the eye cream-coloured, the

horns of moderate length; the colour varies from red to white, or is red and white mixed. These cattle are very docile, arrive early at maturity, make little offal, are good milkers, and lay on flesh readily.

2. *Herefords* are about equal to Shorthorns as meat-producing animals, but as milkers they must take a lower place. The herd which fixed the characters of this breed was sold in 1819, and so supplied sires and dams to farmers outside Herefordshire. In form these cattle are longer than the Shorthorns, with deeper shoulders and the buttocks not quite so straight. The general colour is red, with the face, breast, belly, feet, top of tail, and tops of the shoulders white. This breed is in high estimation in many parts of the United States and in Canada, New Zealand, and Australia.

3. The *Devons* are a small, symmetrical race, found chiefly in Devon, Somerset, Dorset, Hants, and Wilts. They vary in colour from a rich dark red to chestnut, occasionally with a patch of white on, or just in front of the udder. The oxen are much larger than the cows or bulls, and make admirable draught animals. The hair may be smooth, or curly and mossy, and the skin is often mottled. The shoulders are smooth, and the back well filled behind them; the general form compact, and the buttocks somewhat rounded. These cattle do not give large quantities of milk, but the quality is high, and Devonshire cream is noted all over the country. On a given quantity of food it is said that they will make more beef than any other breed, while the meat itself is firm, well-flavoured, and juicy. The bone is usually very fine, and the quantity of offal is small.

4. *Sussex* cattle are in many respects similar to Devons. They are of much larger size, coarser in form, and with large, bony heads. They are probably descended from the same stock as the Devons. They were largely bred for the butcher, and with the disuse, to a large extent, of draught animals, more attention has been paid to the capacity of the breed for milk.

5. The *Norfolk* cattle are said to have originated from the crossing of the cattle of the district with the yellowish-red cows of the Galloways. They are bred so as to fatten in the shortest time, and are generally of a large size. The head is high and knobbed, the neck is always black, and the colour is a rich red. They are not so good for corn-growing as the other breeds, but are better for the production of meat. They are bred so as to give a large quantity of offal.

6. The *Lincoln* cattle are of a different character, and are much larger than the other breeds. They are found in the Vale of Lincoln, and are bred so as to give a large quantity of offal.

bred with a view to perpetuate useful points and to eliminate defects. This good work was accomplished by Robert Bakewell, of Dishley, near Loughborough, Leicestershire, about the middle of the eighteenth century, and to him is due the credit of having laid the foundation of the systematic breeding of modern times. Bakewell did his work so well that the breed soon spread all over England. The Shorthorns were the first to contest their supremacy, and now the race is rapidly diminishing. The body is long, and supported by short legs; the colour is brindled with mixed red, yellow, and black, and black and white, with the white predominating along the back and belly. The peculiar feature is the horns, which are often over 30 inches long; they grow downwards and turn in towards the jaw, sometimes to such an extent as to prevent the beasts grazing short grass. The breed was esteemed both for dairy and grazing purposes.

7. The *Welsh Cattle* are closely related to the half-wild cattle of Chillingham and Cadzow. Three strains of blood, if not three breeds, may be noted:—(1) The *Glamorgans*, now nearly or quite extinct. They were excellent milkers, and made good beef. The cows were red or rich brown, and the bulls invariably black with more or less white. (2) The *Angleseas*, celebrated as grazing stock, and differing little from (3) the *Pembroke* or *Castle Martins*, which should be black, any white being regarded as an indication of strange blood. They are very hardy, and useful both to the grazier and the dairy farmer.

8. *Black Galloways* are an ancient breed found principally in the three counties of Scotland which lie farthest to the south-west—Wigton, Kirkcudbright, and Dumfries. They are strongly built, rather low in stature, of hardy constitution, jet black in colour, and hornless. The milk-producing qualities of this breed have been neglected, and they have been bred with the view to producing as much meat as possible. The milk, however, is very rich in fats, and the breed would improve greatly as milkers if more attention were devoted to this point, and the practice of allowing the calves to suck the dams were abandoned. In Scotland these cattle are rarely housed, and the young are generally sold to graziers in England for fattening.

9. The *Kerrys* are undoubtedly aboriginal and the only native Irish breed. They are slender in form, with fine long limbs, small head, and horns which, after projecting forwards, turn suddenly backwards. The general colour is black, with a small patch of white in front of the udder. They are very numerous in County Kerry, are excellent milkers, and from their gentle disposition and capacity to do well when tethered on small bits of grass are well adapted for small villa farms. House-feeding also agrees with them admirably. The *Dexter* variety has a round plump body, short, thick legs, heavier head, and longer, straighter, and coarser horns.

10. *Polled Aberdeen* and *Angus*, though originally distinct breeds, are now generally classed as one. They bear a general resemblance to the Galloways, but are longer in the limbs and not so

compactly built. They are very hardy, good breeders, little liable to disease, arrive early at maturity, and ripen quickly. The prevailing colour is black, but in and shades of yellow are not uncommon. The cows give a small quantity of milk for their size, but the bad practice of allowing the calves to suck the dams is chargeable with this, for many Angus cows make good dairy cattle. This breed won the prize at the Paris Exhibition of 1878 for the best couple of foreign cattle.

11. *West Highland Cattle* or *Kyloes* are essentially mountain cattle, and representatives of an ancient race, and those of the mainland greatly exceed in size those of the islands of Orkney and Shetland. They are distinguished by their symmetrical form, their fearless mien, shaggy coats, and long horns, with which they are apt to gore each other, for their disposition is pugnacious. In hue they are generally self-coloured—yellowish brown, black, liver-grey, or red, but occasionally brindled. They are very hardy animals, and will pick up a subsistence where lowland cattle would starve. Their carriage is bold and striking, and they are often kept in parks. The cows give a fair quantity of milk for their size, but the breed is more valued as meat-producers; their beef is of excellent quality and commands a high price.

12. The *Ayrshires* are a hardy breed of heavy-looking dairy cattle, with an infusion of West Highland blood, which is shown by the shape of the horns and the temper of the animals. They are of small size, and the general colour is red and white or yellow and white, occasionally self-coloured, and shaded to dark brown. According to Mr. Scott Burn (*Outlines of Modern Farming*), cattle of this breed are justly celebrated for dairy purposes; indeed, they seem to possess the power of converting the elements of food more completely than any other breed into cheese and butter.

13. *Jersey Cattle* are distinguished by their deer-like head, full eyes, and curved horns. They are of medium size and generally fawn with a darkish shade, which is not inaptly described as smoke-coloured, and which approaches that of the cattle of Switzerland and the Tyrol. They are essentially better cows, and lay on flesh slowly. A few are kept in large dairies to impart a rich colour to the milk and butter.

14. The *Guernsey Cattle* are somewhat larger and stouter in form, of hardier constitution, and yellow and white in colour. They are good milkers, and are frequently kept by private householders. Both these breeds were formerly known as *Alderneys*, from the fact that Alderney was the shipping point from the other islands to England, and so gave its name to all cattle exported to England from Jersey, Guernsey, Sark, or the mainland of France. In the Channel Islands the cattle are always tethered and tended by children, and are never allowed to roam at will.

The cattle of the chief English colonies are, as might be expected, in large measure descendants.

English breeds, or the native cattle have been greatly modified by the importation of English bulls for breeding purposes. A similar state of things obtains in the United States, where herds

exist in no whit inferior to many of those in Britain, and on that side of the Atlantic, as on this, the Shorthorns are, on the whole, the most highly esteemed. [DAIRY FARMING, FARMING.]

Cattle Plague, or **RINDERPEST**, is a contagious disease which affects ruminants, particularly oxen, and which is happily of only occasional occurrence in Great Britain. The natural home of the disease is Central Asia (Persia, India, and China); it is of not infrequent occurrence in Russia, and has been from time to time imported into Great Britain. Outbreaks innumerable of fatal murrains affecting cattle are on record, and some of these are, probably with justice, supposed to have been rinderpest; in the absence of detailed descriptions of symptoms it is, however, very difficult to pronounce with certainty upon the diagnosis of a malady which has only been scientifically studied within quite recent times. The most recent serious outbreaks of the disease which have occurred in Great Britain were those of 1865 and 1872. The chief symptoms of rinderpest are high fever, accompanied by inflammation of certain mucous membranes, with great prostration, and in most cases death occurs after from five to seven days. On post-mortem examination there is found to be marked involvement of the intestines, accounting for the dysenteric diarrhoea which is usually present during life, and other mucous membranes, particularly that of the respiratory tract, may be also involved. The disease is inoculable, and when so produced the incubation period is found to be short, usually about forty-eight hours. Protective inoculation with attenuated virus has been tried, but not hitherto with very marked success. The bacteriology of the disease has been worked at with much assiduity of late years, but it cannot be said that the problem has as yet been solved. Much has been done by legislative enactments to prevent the spread of the disease in Great Britain, and the importance of stringent regulations is sufficiently manifest from the fact that the money loss caused by the ravages of rinderpest in 1865-66 in Great Britain was certainly not less than £5,000,000.

Catullus, **GAIUS VALERIUS**, poet, was born about 84 B.C. in Verona. Little is known of the details of his life. While still a boy, however, he tells us that he played at rhyming. Settling in Rome, he included amongst his friends Cicero, Hortensius, Metellus, and other leading men of the time. He also fell in love with Clodia, the beautiful sister of Publius Clodius Pulcher, and vented his passion in numerous lyrics, which are the best of their time. In the political struggles that subsequently disturbed Rome, he embraced the cause of the senate and fiercely attacked Cæsar and others in his verses. He was seriously affected by the loss of a loved brother towards the end of his own brief career, which ended about B.C. 54. Upwards of a hundred pieces from the pen of this great poet are extant, mostly short. The *Nuptials of Peleus and Thetis* and the *Atys* are the longest and most remarkable. For over three hundred years the text of Catullus was lost. It was recovered at his birthplace in the fourteenth century. Remains of a

villa said to have been his exist at Sirmio, a promontory on the S. of the Lago di Garda, whose beauties he celebrates.

Caub, a town of Prussia, in the province of Hesse-Nassau, is situated on the Rhine. It was here that Blucher's army crossed that river on Jan. 1, 1814. Slate quarrying is the chief industry.

Cauca, a river of South America, in the United States of Colombia; also the name of the largest one of these states covering an area of 260,000 square miles. The river, after a northerly course of 600 miles, flows into the Magdalena.

Caucasians. I. In *Anthropology* the conventional name of one of the main divisions of mankind, for which see CAUCASIC RACE. II. In *Ethnology* the aborigines of the Caucasus, who are grouped (mainly on linguistic grounds) in four divisions: 1. *Southern*: Georgians, Imeritians, Mingrelians, Lazes, Swanithians, Khevsurs Pshavs, collectively forming the *Kartveli* family; 2. *Western*: Circassians, Abkhasians, Kabardians; 3. *Central*: Ossetes or Irons; 4. *Eastern*: Lesghians, Avars, Chechenzes, Ingush, Kist, Tush, Dargo, Kazi-Kumyksh, and many others collectively known as *Daghestani*, a term, however, which simply means "highlanders." These four divisions must for the present be held as fundamentally distinct, all attempts to reduce the several languages to a common mother tongue having hitherto failed. No. 3 (Ossete) belongs to the Aryan stock with Iranian affinities. All the others are strictly indigenous with no known affinities elsewhere. No. 1 certainly, No. 2 probably, and No. 4 very doubtfully, form each a linguistic family, and are sprung from three now extinct stock languages. No. 4 has but slight unity, and in it are often grouped such as the *Ingush* and *Tush*, whose languages are very different from each other and from a *Kabardian* differs profoundly from both Circassian and Georgian. The Caucasus altogether presents problems of an extraordinary complexity goes back to the time when the Caucasus was already the "Mountain of Imeretia" as that in his time as mentioned in the port of Tiflis apart from Ossete, which is sectional, all the other languages have in common, that the general order of speech is Georgian, Circassian, and Kabardian. The division is so marked that it is easily drawn. The ethnologists have in many instances been misled by their preconceptions, and have characterised the Caucasian as an extraordinary. In *Itzkhet*, the Georgian king, the differences between the communities are so marked that the remnants of the

have in remote times taken refuge in the Caucasian highlands from conquering hordes sweeping over the Russian and Asiatic steppes. The Caucasians have long been regarded as physically, perhaps, the finest branch of the Caucasian type, which, in fact, is named from them. No doubt many, especially of the Circassians and of the Georgian group (Mingrelians and Imeritians), present a magnificent physique, so far justifying anthropologists in accepting them as typical specimens of the race. But great diversity prevails, and some of the hill tribes, such as the Pshavs and Swanithians, have coarse, ill-favoured features, and ungainly figures. The Ossetes also have a far from prepossessing appearance, and many of the highland populations seem to have been degraded from want and hardships in their barren upland valleys. But all without exception present the distinctly Caucasian type, as opposed to the Mongolic of most Asiatics. III. In *Ethnography* all the inhabitants of the Caucasus, including, besides the aborigines, Mongol, Russian, Armenian, and other intruders, number altogether about 6,270,000 as under: Southern Caucasians, 904,000; Western Caucasians, 188,000; Central Caucasians (Ossetes with other Iranians), 280,000; Russians, 1,905,000; Armenians, 810,000; Chechenzes, 265,000; Lesghians, 537,000; Mongolo-Tatars, 1,286,000; Jews, Arabs, and other Semites, 30,000; sundries, 70,000. For details see under the several entries.

Caucasic Race, one of the main divisions of mankind, so named by Blumenbach, who regarded the aborigines of the Caucasus as the most typical branch of that division. As contrasted with the other two divisions (yellow, black lank-haired, flat-featured Mongol, and black, woolly-haired, prognathous Negro), the ideal Caucasian man is fair, with light or brown hair and regular features. But two sub-types are distinguished by Huxley and others: the *Xanthochroi* ("fair-coloured"), assumed to represent the true primitive Caucasian stock, characterised by flaxen or light brown wavy hair, dolichocephalic skull (long from occiput to glabella), florid complexion, large, straight or slightly aquiline nose, large blue or hazel eyes, tall stature (mean, 5 feet 8 or 9 inches); and the *Melanochroi* ("dark-coloured"), characterised by black and rather straight hair, brachycephalic skull (short or round), pale or sallow complexion, small nose, black eyes, medium height (5 feet 6 inches). Originally the fair type is supposed to have occupied the higher latitudes, at least in Europe (Scandinavia, North Germany, Baltic provinces), while the dark was grouped round the Mediterranean lands (North Africa, West Asia, South and West Europe, especially Iberia and parts of Britain); but for countless ages interminglings have been incessantly going on, so that at present the great bulk of the Caucasian peoples show almost everywhere endless shades of transition between the two extremes, evident not only in all the great divisions and their minor branches, but even in family circles and in the individual (light hair and dark eyes; florid complexion and black hair often seen in same person). On the ethnical border-lands

both merge imperceptibly in the conterminous Mongolic and Negro types, as through the Finns and Lapps in the north, through the Turkomans in the east, through the Gallas, Somals, and Tibbus in the south. But the average Caucasian man (and in the present mixed state of the human species it is now everywhere a question of averages) can still be easily distinguished from the average Mongol and Negro, both of whom he far excels, especially in his mental qualities. The Caucasian is also the most numerous, the most widespread, and in every respect the leading division of mankind. The Mongols are popularly supposed to be the most numerous, but this is owing to the exaggerated estimates of the population of China (the chief Mongolic domain), and to the common mistake of regarding all Asiatics as Mongols, many millions being really Caucasians. Caucasian speech also belongs mainly to the inflecting, that is, to the highest order, almost the only exceptions being the Basque of the Western Pyrenees, and perhaps most of the idioms spoken by the aborigines of the Caucasus. Apart from these, the three great Caucasian linguistic families (all inflecting) are the *Aryan*, *Semitic*, and *Hamitic*, whose collective domain now comprises most of Southern Asia between the Bay of Bengal and the Mediterranean, nearly all North Africa between Sudan and the Mediterranean, nearly all Europe, a great part of South Africa, most of Australasia, all North and Central America, with but slight exceptions, and by far the greater part of South America. The domain thus comprises about half the population of the globe, say 720,000,000, all of Caucasian speech, but not all of Caucasian stock, as shown by the Aryan-speaking Negroes of the New World, the numerous Finno-Ugrian peoples now assimilated in speech to the Aryan Slavs, and so on. Allowing 20,000,000 for these, there still remain some 700,000,000 who belong, both in physical type and speech, to the Caucasian division of mankind. For details see *ARYAN, SEMITIC, HAMITIC RACES AND LANGUAGES*, and *CAUCASIANS*, II.

Caucasus, a lofty range of mountains in Russia, traverses the lieutenantancy of Caucasia from N.W. to S.E., and extends for a length of 700 miles between the Black Sea and the Caspian. It thus forms the boundary between Europe and Asia, which latter country the region more particularly resembles. It is composed for part of its length of parallel chains, connected by elevated table-lands. In the central chain are found the most lofty peaks—Mount Elbruz, 18,572 feet; Koshtan-tan, 17,123 feet; Dych-tau, 16,928 feet; and Kasbek, 16,546 feet. Across Kasbek is the Eng or Dariel Pass, called the Caucasian Gates, whereby Russia has her only carriage communication with her Transcaucasian territories, unless by the Caspian shore. The line of perpetual snow in the Caucasus is 11,000 feet. The rivers that principally drain the range are the Kuban and Rion, anciently *Phasis*, flowing into the Black Sea, and the Terek and Kur, flowing into the Caspian. Some portions produce only grass, though on the whole vegetation is vigorous, especially near the Black Sea, where the slopes are

covered with immense forests of oak, beech, maple, ash, and walnut, while in the valleys are grown rice, tobacco, indigo, cotton, hemp, fruits, and various grain crops. The mineral products are extensive, and at Baku on the Caspian are rich petroleum wells. Though there are no active volcanoes in the Caucasus, the region is yet visited by earthquakes, and the principal peaks are evidently of volcanic origin.

Cauchy, AUGUSTIN LOUIS, mathematician, was born in 1789 at Paris. At one time tutor to the Comte de Chambord, he was in 1848 appointed to the chair of astronomy at Paris, but on the accession to power of Napoleon III. he retired, and died in 1857. His *Memoire sur la Théorie des Ondes* afforded a basis for the subsequent development of the undulatory theory of light.

Caucus, the name given to a kind of inner committee that nominates candidates for Parliament, and is supposed to act generally for a constituency or party at large. The name and practice were adopted from America by the advanced Liberal party in Great Britain. There is some dispute about the origin of the name, which appears as early as 1753, in John Adams's diary. Some think it from the Mod. Gk. word *kaukos*, a cup, and to have a social club-like signification, while others refer it to a Red Indian origin, since Pocahontas's Captain John Smith uses words somewhat resembling it in reference to Indian councils.

Caudebec, a town of France, in the department of Seine-Inférieure, is named Caudebec-les-Elbeuf to distinguish it from Caudebec-en-Caux, an ancient village in the same department.

Caudex, an unnecessary botanical term applied to the unbranched stems of tree-ferns, palms, and similar arborescent plants.

Caudine Forks, associated with a disastrous defeat of the Romans by the Samnites, 321 B.C., are two ravines in ancient Samnium, and near the town of Caudium.

Caul, a term applied to the amniotic membrane [AMNION], which is sometimes carried before the head of the child at birth. Children born with their heads enveloped in a caul were supposed to be peculiarly lucky, and the possession of such a piece of membrane, whether obtained by accident of birth or by purchase, was supposed by the credulous to confer certain advantages upon the owner. The caul was supposed, for example, to be a certain preservative against death by drowning. Again, it was held that the owner of the caul could inform himself as to the state of health of the person who was born with it, by noting the degree of dryness or flaccidity of the membrane. The market value of a well-preserved caul was considerable up to within quite recent years.

Caulerpa, a large genus of marine Alga, belonging apparently to the *Siphonocæ*. They occur mostly in warm seas, reach a length of several feet, varying much in form, and are a bright green. The most remarkable feature they present is that, though often differentiated externally into parts resembling

rhizoids or rootlets, stems, and pinnately-lobed leaves, they have no internal divisions or cell-walls, so that they must either be considered unicellular or the cell theory must be admitted to be altogether inapplicable to this and some similarly constituted groups of organisms. *Caulerpa* furnishes the chief food of some marine turtles.

Cauliflower, a variety of the cabbage (*Brassica oleracea, botrytis cauliflora*) in which an abnormally enlarged, much-branched depressed inflorescence with fleshy branches and abortive flowers is produced. It was in cultivation in England in the sixteenth century, more than a century before the more robust winter variety, the broccoli (*B. oleracea botrytis asparagoides*). Besides its use as a boiled vegetable, cauliflower makes an excellent pickle.

Caulking, or **CALKING**, the operation of driving oakum, or unravelled rope, between the interstices of a ship's planks or decks, so as to render the whole watertight. Having been driven in, the caulking, for preservative purposes, is covered with hot pitch, resin, or marine glue. Caulking-irons are iron chisels used for the purpose of caulking.

Caura, a river of Venezuela, flows into the Orinoco. It is also the name of a territory covering an area of upwards of 22,000 square miles.

Caus, **CAULX** or **CAULS**, **SALOMON DE**, engineer, was born in 1576 at Dieppe. In a work published in 1615 he describes a mechanism for driving up water by a steam fountain, on which is based by some a claim that he anticipated the invention of the steam-engine. He was architect to the King of France from 1623 till his death in Paris in 1626, having previously been in the service of the Prince of Wales, and of the Elector Palatine at Heidelberg.

Causality, the relation of one fact or set of facts, as being necessary to others, or them about. Philosophy has been more disposed to dispute about cause and effect. Aristotle distinguished Formal, Efficient, and Final causes, but the latter disappeared with the rise of modern science, and Efficient has passed into "precedent" of Hume and Kant, and purpose for which a thing is done, soon banished at least from scientific research, and in this sense the cause of a thing is its explanation. The term has been defined as "the necessary antecedent of any event," but this is not taken to mean that the cause is later with respect to the effect. Causation is a universal term, and causation is a universal term, and certain of the laws of nature are to be known, i.e. that the events are necessary but others are not necessary laws of nature.

explains at some length that assigning the cause of an event is simply bringing one phenomenon under a wider set of phenomena.

Cause Célèbre (French), a celebrated case, a term applied by the newspapers to a sensational trial.

Causerie, literally *a chat*, is a name given to a short and informal essay or discussion upon any subject or set of subjects; and is generally of a more rambling, discursive nature than the essay proper.

Caustic (Gk. *burning*). Caustics or escharotics are used to burn away living tissues in cases where some poison has obtained entrance to a wounded surface. Thus in dog-bites it is a common practice to apply caustic in the hope of preventing the possibility of the development of hydrophobia. Indolent ulcers are sometimes touched with caustic to stimulate the tissues in the hope of accelerating healing. The principal caustics are potash, soda, lunar caustic (nitrate of silver), chloride of zinc, arsenical paste, and acid nitrate of mercury. Caustic, in *Optics*, is the bright surface or curve formed by reflected or refracted rays of light under special conditions. [OPTICS.]

Cautery (Gk. *a branding - iron*). The old classification of cauteries is into actual and potential. The potential cautery is a stick of caustic (q.v.), the actual cautery is a hot piece of metal. The actual cautery is used in surgery as a counter-irritant, and as a means of checking hæmorrhage. In its simplest form it consists of a piece of iron which is made white hot in the fire; in the benzoline or Paqueline's cautery the surgeon possesses a useful instrument, the heat of which admits of regulation by working a spray-producer, which drives a stream of benzoline vapour between heated platinum surfaces. The heat of the cautery varies with the rate at which the vapour is made to ignite. In the galvano-cautery a galvanic current is caused to heat a platinum wire. Paquelin's and the galvano-cautery are often used in operations upon structures which bleed readily, and in which it is difficult to control bleeding points by ligature or torsion.

Caution, a term in Scots law equivalent to "Guarantee" in England, whereby a third party to any contract undertakes to fulfil the obligations of the second party (the obligee). On this subject the law of England and Scotland has been amalgamated by the "Mercantile Law Amendment Act" passed in the year 1856, and under which a creditor is entitled to proceed at once against the cautioner as if he were a joint obligant, and without suing the principal obligor or debtor. The cautioner is at liberty to set up any defence which was competent to the principal debtor. The cautioner in the event of any important change in the debtor's obligation, made without his (the cautioner's) assent, is discharged. Changes of partnership, either of creditor or debtor, have the effect of cancelling the guarantee; so also will time given to the debtor without the cautioner's consent; and the discharge of one cautioner (if there be several), without consent of the others, operates as a

discharge to all. The cautioner on full payment of the debt is entitled to an assignment of the same, with all securities therefor in the hands of the creditor, and, in fact, takes his place against the original debtor or obligor.

Cavaignac, LOUIS EUGÈNE, was born in 1802 at Paris. Prepared for the military profession, he served in the Morea, and on the breaking out of the Revolution in 1830 he rather hastily pronounced in favour of it, for which he was sent to Africa into honourable exile. There he distinguished himself by his valour, and by 1844 had risen to the rank of brigade-general; in 1848 he was appointed governor-general of Algeria, but in view of the threatening state of affairs, was recalled to Paris, and made minister of war. When, in June, the insurrection broke out, he was appointed military dictator. For three days, from June 23rd to the 26th, the streets of Paris presented terrible scenes of carnage. At last, however, order was restored, and Cavaignac resigned his dictatorial power into the hands of the national assembly. Towards the end of the year he became a candidate for the presidency of the republic, but Louis Napoleon was preferred. After the *coup d'état* of December, 1851, he was arrested, but though he refused to own allegiance to the empire, he was soon liberated. He was twice elected to the legislative assembly, but refusing to take the oath, was incapacitated from serving. He died in 1857 near Tours.

Cavalcanti, GUIDO, poet, was born in 1230. He suffered banishment by his party, the Ghibellines, and in broken health came back to Florence to die. He was a friend of Dante, and wrote beautiful ballads and sonnets.

Cavalcaselle, GIOVANNI BATTISTA, was born in 1820 at Legnago. He is chiefly known through the works written jointly with J. A. Crowe, whom he first met in Germany. These are *Early Flemish Painters*, *History of Painting in Italy*, *Titian*, and *Raphael*. He was chief of the art department under the minister of public instruction in Rome. He died in 1897.

Cavalier (from Lat. *caballus*, a horse) formerly denoted simply a horseman; then, as riding became almost the privilege of the upper classes, it denoted a knight, and later a gentleman. The adherents of Charles I. called themselves cavaliers. In some connections the word is absurdly used, but not in good English, to denote anyone in attendance upon a lady, especially in dancing. The word is still used by the French in its original sense. It was formerly used in fortification to denote an inner defence that overtopped and overlooked the outer works.

Cavalry, troops designed to fight principally on horseback. Under the feudal system every holder of land was assessed at a "knight's fee," whereby he was "required to provide a charger, a coat of mail, a helmet, shield, and lance," and either he or his deputy had to serve the Crown a period of forty days in any year at his own expense. The cavalry of a mediæval army consisted of those knights and men-at-arms, and Hobiliers, or inferior horsemen, who bore the brunt of the battle; the

infantry being accessories. But the introduction of gunpowder changed the rôle of the mounted arm, and it became auxiliary to the infantry. The "men-at-arms" with complete armour gave way to the "spears and lances" in the reign of Mary, and when the lance fell into disuse, the cavalry were designated "Horse," and were generally cuirassed. They were armed then with swords and a pair of pistols or petronels; and as the musket improved, so another mounted "arm," the "dragoon"—destined to become true cavalry later on—was introduced. He was at first merely a mounted infantry man, armed with the infantry musket, the "Horse" then carrying a lighter carbine. Eventually the armament of both assimilated, and during the early part of the eighteenth century there was no practical difference between them either in their work or equipment. In the British army the regiments of "Horse" were reduced to Dragoons in 1746; but to distinguish them from the original dragoon regiments they were given the title of "Dragoon Guards." Finally, light dragoons were generally added to the establishments of most armies, and these were eventually changed into "Lancers" and "Hussars," the former being armed with lances, the dress of the latter being changed. At present the cavalry of an army is divided into heavy regiments, such as 1st and 2nd Life Guards, the Horse Guards, and the 1st and 2nd Dragoons; medium, the Dragoon Guards; and light, as the Hussars and Lancers. A cavalry regiment consists of four squadrons, each of two troops, and numbers about 400 men. The weight carried by the horse varies from eighteen to twenty-two stone.

Cavan, a county of Ireland in the south of Ulster, covers an area of about 750 square miles, 200 of which are under cultivation. Agriculture forms the staple industry, but is retarded by the rugged character of much of the ground, by the moistness of the climate, and by deficient drainage. The industries, other than agriculture, consist of the manufacture of linen and the distilling of whisky. Coal and iron are found in the county. It returns two members to parliament. Pop. (1901), 97,541. The chief rivers are the Annalee, Erne, and Woodford, and the towns Cavan, Cootehill, and Belturbet. Cavan is similarly the name of the county town, which is situated on a tributary of the Annalee. Besides a school, founded by Charles I., it has also a Roman Catholic college.

Cavatina, in *Music*, a term now applied indiscriminately to any kind of aria; it originally signified, however, a melody of a smooth character, simpler than the aria and with no repetitions.

Cave, a hollow extending beneath the surface of the earth. Natural caves may originate in the expansive force of volcanic gases, as in the Grotto del Cane, near Pozzuoli, in which carbon-dioxide still escapes from crevices in the floor; or in the erosive action of sea-waves and of the compression of air that they produce, as in Fingal's Cave, hollowed out of the columnar basalt of Staffa; or in the solvent action of water charged with carbon-dioxide acting along joints in limestones. Some of these latter, such as the Mammoth Cave of

tucky, and those of Adelsberg, extend for many
s, branching into innumerable chambers.
ams of water may still traverse them, or the sub-
anean drainage having been deflected, the floors
aves may be dry and suitable for occupation by
or animals. Caves have been used in all ages
man as dwellings, as refuges, or as tombs. In
e in the Cretaceous limestones of Perigord the
ains of an Esquimaux-like race, using rude
leolithic) flint-implements have been found,
ther with the bones of the animals they hunted,
uding the extinct mammoth, and cave-bear, and
reindeer, these bones being sometimes incised
a graphic outline representations of the animals
n alive. Many caves in Wales, France, and
in yield remains of men of an Iberian or
que race, who used polished stone (*Neolithic*)
lements. The temporary sojourn of Lot and of
id in caves, and the burial-cave of Machpelah
instances that may be cited from Holy Writ.
icles of the Bronze Age and others coming down
he fifth century have been found in caves in
ain, whilst in Arabia, China, and Central
ica many people still lead an underground life.
dark recesses of caverns and their use as
ages by conquered races have in most countries
ociated them with much legendary lore of oracles,
ds, nymphs, fairies, sleeping heroes, and en-
nces to the nether world. [BONE-CAVES.]

Cave, EDWARD, printer, was born in 1691 at
aton, Warwickshire. In 1731 he founded the
Attorney's Magazine, the earliest journal of its
d. In 1740 Johnson became parliamentary re-
ter to it. Cave was the first to give Johnson
rary work.

Caveat, a process formerly in use in the
ritual Court, now used in the Court of Chancery
prevent or stay the progress of a bill in the
ning of administration. When a caveat is
cts. When a caveat is
ill or granting admini
lows to determine citl
tament or who has a ri
im or obstruction by
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son entitled, and as so
ision of the Probate C
will or granting the ad
also in use in Chanc
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full court, because a
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licature Act, 1857
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Caveat *Ex*
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Cave Bear (*Ursus spelæus*), a gigantic extinct
species of bear, surpassing the Polar bear in size
and apparently closely related to the grizzly bear,
the bones of which are found fossil in the Cromer
Forest-bed (*Pliocene*), and in cave-deposits
(*Pleistocene*) in England, Europe, and Asia.

Cave-lion (*Felis spelæa*), a fossil lion found in
Cave-deposits (*Pleistocene*). It was larger than,
but specifically identical with the lion (q.v.).

Cavendish, LORD FREDERICK CHARLES,
second son of the seventh Duke of Devonshire, was
born in 1836, and educated at Trinity College,
Cambridge, where he graduated B.A. in 1858. Be-
coming private secretary to Lord Granville in 1859,
he was returned in 1865 for the West Riding of
Yorkshire, which he represented until his death.
He succeeded Mr. Forster as Chief Secretary for
Ireland, but a few days after his appointment in
1882, he, with Mr. Burke, an assistant secretary,
was murdered by the "Invincibles."

Cavendish, GEORGE, author, was born in the
beginning of the sixteenth century. In 1527 he
entered the service of Cardinal Wolsey as his gen-
tleman-usher. After the cardinal's fall he retired to
Suffolk, where he lived with his wife, a niece of
Sir Thomas More. He retained a strong affection
for his late master, and wrote his biography, one of
the most interesting productions of its kind in the
English language.

Cavendish, HENRY, chemist and philosopher,
son of Lord Charles Cavendish, and nephew of the
third Duke of Devonshire, was born in 1731 at
Nice. Though a man of great wealth, he lived in
seclusion, devoting himself to scientific researches.
In 1760 he discovered the levity of hydrogen, thus
preparing the way for ballooning. He also found
out the composition of water, and measured the
density of the earth. He was distinguished for
the accuracy of his processes, and is sometimes
spoken of as the Newton of Chemistry. His
writings are confined to papers in the *Philosophical
Transactions*. He was a man of extraordinary
shyness, and was so averse to meeting anyone
that he had his magnificent library four miles from
his residence, so as not to encounter any one coming
to consult it. He never married, and died in 1810
at Clapham, leaving over a million sterling.

Cavendish, THE RIGHT HON. SPENCER
COMPTON, DUKE OF DEVONSHIRE, MARQUIS OF
HARTINGTON, was born in 1833, and educated at
Trinity College, Cambridge, graduating B.A. in 1852.
He first entered parliament in 1857, representing
North Lancashire in the Liberal interest, and first
took office as a Lord of the Admiralty in 1863. From
that year until 1866 he was Secretary for War, and
in 1868, losing his seat for North Lancashire, he was
soon after returned for the Radnor Burghs, when he
was appointed Postmaster-General. He held that
office until 1871, and then became Chief Secretary
for Ireland until 1874. On Mr. Gladstone's temporary
retirement from the leadership of the Liberal
party, Lord Hartington was chosen in his place. At
the general election of 1880 he was returned for the

Radnor Burghs and for N.E. Lancashire, the latter of which he elected to sit for. In 1886 he dissented from Mr. Gladstone's Home Rule policy, and thenceforward became leader of the Liberal Unionists. He joined Lord Salisbury's Ministry in 1895 as President of the Council, and in 1900 became President of the new Board of Education. In 1903, however, he left Mr. Balfour's Ministry as he could not agree with the Premier's attitude on the Fiscal question; being a strong Free Trader, he determinedly opposed Mr. Chamberlain's proposals. He succeeded to the Dukedom in 1891, and died in 1908.

Cavendish (or CANDISH), THOMAS, one of the greatest of the Elizabethan navigators, was born in Suffolk about 1555; and in 1586 left England in command of an expedition which met with great success against the Spaniards, and which, having circumnavigated the globe, returned in 1588. Cavendish had previously served under Sir Richard Grenville against the Spaniards in the West Indies. In 1591 he sailed on a second voyage round the world. He lost all his ships save one by wreck or desertion, and died at sea, early in 1593.

Cavendish, WILLIAM, DUKE OF NEWCASTLE, son of Sir Charles Cavendish, was born in 1592, and educated at St. John's College, Cambridge. Becoming a favourite at court, he was made Earl of Newcastle by Charles I., whom he strongly supported against the Parliamentarians. He was appointed general of all the King's forces raised north of the Trent, with power to issue edicts, confer knighthoods, coin money, etc. After the royal cause became hopeless, he retired to the Continent, where he remained until the Restoration, when he was rewarded with a dukedom.

Cavendish Experiment, a method devised by Michell, and improved by Henry Cavendish, to determine the constant of gravitation; that is, the force with which unit mass attracts unit mass when the two are placed at unit distance apart. A knowledge of this enables us to calculate the mass of the earth. Two spheres of equal mass are suspended from the ends of a thin horizontal rod, supported at its centre by a fine vertical wire. Two larger spheres are placed so as to turn the horizontal rod by attracting the smaller masses, and the time of oscillation of the rod is observed. This and a few data of the different positions of the rod are sufficient to determine the required constant. Baily's experiments gave it the value of 6.48×10^{-8} with the ordinary absolute units; the mass of the earth is then 6.14×10^{27} grammes, or about 5×10^{24} tons, and its mean density 5.67 as compared with water. The Cavendish experiment is being repeated with much greater accuracy and on a much smaller scale by Professor Boys. [GRAVITATION.]

Caviare, a word of Tartar origin, denoting a food or relish made of the salted roes of sturgeon and other allied fish, especially the sterlet. Most of the caviare used comes from the fish of the Black Sea and the Caspian, and the rivers flowing into them.

Cavour, COUNT CAMILLO BONSO DI, statesman, was born in 1810 at Turin. At the age of sixteen

he was appointed sub-lieutenant in the Engineers. His liberal sympathies, however, led him to incur the displeasure of the authorities, and in 1831 he resigned. He came to England and spent several years in studying the British constitution, and making valuable friendships, his object being the regeneration of Italy. At length he thought the time had arrived for more direct action, and in 1847 he established the *Risorgimento*, a newspaper, in which he advocated the principles of representative government. He took the lead in getting the king to grant the Constitution of 1848, and he himself was returned as one of the representatives for the Capitol. After the battle of Novara he, having counselled peace, rose in popularity, and became successively Minister of Agriculture and Commerce, Minister of Marine, and Minister of Finance. In 1852 he succeeded to the premiership, and henceforth till his death, excepting a brief period, was the first minister and ruler of his country. His policy throughout was designed to accomplish the unification of Italy (q.v.), which he lived to see practically realised; for in 1861, the year of his death, an Italian parliament met, and Victor Emmanuel (q.v.) was proclaimed King of Italy.

Cavy, any species of *Cavia*, a genus of rodents, of which the Guinea-pig (q.v.) is the type.

Cawnpore, a city in the North-West Provinces of India and capital of the district of the same name, is situated on the right bank of the Ganges, about 1,000 miles from the sea. It is a modern town with extensive military cantonments, and as regards industry is noted for its gloves, jewellery, and leather work. British property since 1801, it is associated with one of the cruellest episodes in the annals of the Indian Mutiny (q.v.) of 1857. It then contained about 1,000 Europeans, more than half of whom were women and children, and General Wheeler was in command. The Europeans being outnumbered by the mutineers under the Rajah of Bithoor, better known as Nana Sahib, surrendered under promise of a safe conduct to Allahabad. Just as they had embarked, the natives fired on them and carried the survivors back to Cawnpore. Here, when the news of General Havelock's approach arrived, they were massacred, their bodies being thrown into a well. Over this well is now a mound crowned with an octagonal Gothic structure, and round it are public gardens. A memorial church also marks the site of General Wheeler's entrenchment. The district of CAWNPORE covers an area of 2,336 square miles, and besides its capital has the towns Bilhour, Bithoor, and Akberpoor. It is a fertile region, and produces the vine and the indigo plant.

Caxias, (1) a town of Brazil, in the province of Maranhao, is situated on the Itapicura; (2) an Italian colony in Brazil, province of Rio Grande do Sul, was founded in 1875, and is mainly engaged in agriculture.

Caxton, WILLIAM, first English printer, was born about 1422 in the Weald of Kent. He began as an apprentice to a London mercer, Robert Laye, who was Lord Mayor 1439-40, and was

successful, having gone into business for himself at Bruges. In 1471 he gave up commerce and became attached to the household of Charles, Duke of Burgundy, whose wife Margaret, sister of Edward IV., was subsequently Caxton's patron. He had acquired the art of printing while at Bruges, where in 1474 he printed the first book in the English language, viz. *Recuyell of the Historyes of Troy*, and in 1476 he returned to England, and in the following year printed the *Diates and Sayings of the Philosophers*, the first book printed in England. Another early book of Caxton's was the *Game and Playe of the Chesse*. He was a remarkably industrious man, and an accomplished linguist. He died in 1491.

Cayenne, the capital of French Guiana, is situated on Cayenne island at the mouth of the Cayenne river. Since 1852 it has been a great French penal settlement. The climate is unwholesome, especially for Europeans.

Cayenne Pepper is manufactured from the ripe fruits of various species of *Capsicum* (q.v.). They are dried, ground, mixed with flour and yeast, and baked into hard cakes which are re-ground. Red lead, vermilion, ochre, salt, rice-flour, and urmeric are occasional adulterants of cayenne pepper. It is employed in medicine, chiefly as a stimulant in dyspepsia. In large quantities it acts as an irritant poison.

Cayley, ARTHUR, mathematician, was born in 1821 at Richmond, Surrey, and graduated as senior wrangler and Smith's prizeman in 1842. After practising at the law, he was in 1863 appointed adlerian professor of pure mathematics at Cambridge, and in 1875 fellow of Trinity College. He was a member of the leading scientific societies, and in 1883 was president of the British Association. Among his works are *Elementary Treatise of Elliptic Functions*.

Caylus, ANNE COMTE DE, archæologist, after some military service, turned to the study of antiquities, and became an accomplished engraver. His *Antiquités Egyptiennes, Romaines, et Gauloises* are well known.

Cayman, the name of any individual of the Cayman Islands.

Ceara, a province of Brazil, formerly a colony. An important port, and a centre of commerce, especially in coffee, sugar, and cotton. The capital is Recife.

Cenes, a name of a period of time, after the death of a person, or the end of a period.

Cebidæ, a family of monkeys comprising all the forms found in the New World, and therefore equal to the obsolescent group, *Platyrrhini*. [APE.]

Cecidomyidæ, a family of flies known as the Gall Gnats, and including the Wheat Midge (q.v.) and the Hessian Fly (q.v.). Many species exhibit the phenomenon of alternation of generations, as the larvæ at certain seasons are produced from adults instead of from adults. They belong to the order DIPTERA, under which a summary of the characters is given.

Cecilia, ST., the patron saint of music, is said to have suffered martyrdom in the year 230 A.D. Becoming converted to Christianity, she refused to offer sacrifices to idols, and for this was condemned to death. She is also credited with being the inventor of the organ, and in the Roman Catholic Church her festival, November 22nd, is musically celebrated. Her story is the subject of one of Chaucer's *Canterbury Tales*; Dryden and Pope have also sung in her honour. Painters, too, have depicted her, the most celebrated being Raphael, Dolce, Domenichino, and Rubens.

Cecomorphæ, a group of birds, in Huxley's classification, containing the gulls.

Cecrops, the traditional founder of Athens, and first King of Attica, is said to have implanted the germs of civilisation amongst the rude inhabitants. He is also mentioned as the leader of a colony about 1400 B.C. to Attica from Sais in Egypt.

Cedar, the popular name of a variety of trees, mostly agreeing in having a reddish-brown aromatic wood. The coniferous genus *Cedrus* includes



CEDAR. (*Cedrus Libani*.)

only four forms, all native to the Old World:—*C. Deodara*, the deodar of the Himalayas; *C. Libani*, the cedar of Lebanon and Taurus; *C. Libani*, var. *brevifolia*, of Cyprus; and *C. atlantica*, the Algerian, or Mount Atlas cedar. *Cedrus* has its needle-like leaves fascicled, like the larches; but unlike those trees, evergreen, so that they remain on the tree for several years after the dwarf-shoot

has elongated. Its cones are erect, with broad, thin-edged scales which ultimately fall away from the axis, as in the firs (*Abies*). *C. Libani* has horizontal; *C. Deodara*, drooping; and *C. atlantica*, ascending, branches; but otherwise there is little difference between these geographical races. The Lebanon cedar seems to have been introduced into England about 1670; the deodar in 1822. Among the oldest and finest cedar trees in England is one at Enfield, Middlesex. The wood is durable, and, if not very long-lived, the tree suggests strength by its form, and this is probably the origin of its Semitic name, as it is also at the root of most of the figurative allusions to it in Holy Scripture (Ezekiel xxxi., etc.). Martin frequently introduced the level lines of cedar boughs by the side of Assyrian architecture in his pictures. The wood of *Juniperus bermudiana* is known as pencil cedar, and that of *J. virginiana* is also used in making lead-pencils. *Cedrela odorata*, an angiospermous tree, native to the West Indies, yields the wood known as Honduras, Jamaica, or Barbadoes cedar, used for cigar boxes.

Cedar-bird (*Ampelis cedrorum*), a common North American bird, allied to the Waxwing (q.v.). The plumage is a soft cinnamon, both sexes are crested, and there are red horny appendages on the secondaries of the male.

Cedar Rapids, a town of the United States in Iowa, situated on the Red Cedar river. It is an industrial place, and an important railway centre.

Cedilla (Fr. *cédille*), a mark, placed under the French c, to signify that it has the sound of s. The name is a diminutive of that of the Greek letter Zeta (ζ), which was at one time written after the c for the same purpose.

Cefalu, a seaport town of Sicily, is situated on the N. coast. The seat of a bishop's see, it has a cathedral. Its main industry is fishing. It has also some marble quarries.

Ceglie, a town of Southern Italy, is not far from Taranto. Grain and fruit are among the chief articles of its trade.

Ceiling (from Latin *cælum*, heaven, thence a canopy, or from Latin *cælo*, to carve—according to Dr. Murray, probably the former), the inner roof or upper surface of a room, whether plain or carved, level or domed. It is often papered, painted, or decorated with plaster work.

Celandine, from the Greek *chêlidôn* a swallow, is the popular name for two very different British plants, *Chelidonium majus*, and *Ranunculus Ficaria*. The former, the Greater Celandine, is a glaucous plant with pinnately-lobed leaves, yellow flowers with four petals, a pod-like fruit, and an abundant orange juice, belonging to the poppy tribe. Its juice was used in ophthalmia, an application traditionally alleged to have been discovered by swallows. It is also a rustic remedy for warts and corns; but the corn-cure, now sold under this name, is a preparation of salicylic acid, collodion and Indian hemp, having nothing to do with the plant. *Ranunculus Ficaria*, the Lesser Celandine

or pilewort, one of the commonest and earliest of British flowers, was a favourite with the poet Wordsworth, on whose monument at Grasmere, however, Woolner, the sculptor, has erroneously represented the *Chelidonium*. The Lesser Celandine has three deciduous sepals, and nine pointed golden petals; its leaves are simple, heart-shaped, obtuse and glossy; and its roots are many of them tuberculate, whence, in accordance with the doctrine of signatures (q.v.), the plant was looked upon as a remedy for hæmorrhoids and obtained one of its familiar names.

Celaya, a town of Mexico, in the state of Guanajuato, is situated on the Rio Laja. It has manufactures in woollens and cottons, and was the scene of a dreadful catastrophe on Easter Sunday of 1888, when its bull-ring took fire.

Celebes, the third largest island of the Indian Archipelago, has Borneo on the W., and the Moluccas on the E. Covering an area of about 70,000 square miles, it practically consists of four long mountainous peninsulas, running easterly and southerly and enclosing three gulfs, Gorontalo, Tolo, and Boni, and no part of the island is more than 50 miles from the sea. There are several active volcanoes, especially in the north. In the south and east are wide forests and grassy plains. It is plentifully supplied with lakes, and though its streams are numerous none of them are of any magnitude. Among its products are gold, copper, tin, sulphur, diamonds, iron, and salt. It yields tea, coffee, rice, sugar, tobacco, pepper, cloves, nutmegs, indigo, areca, betel, and various woods and oils. Trepang and turtle are extensively caught. It has also various species of animal peculiar to the island—a tailless baboon, the babi-roussa (q.v.), starlings, and magpies. It is without representatives of the feline or canine animals or insectivora. Though there are numerous small native states on the island, it is practically a Dutch possession. It was taken by the British in 1811, but a few years later they returned it to the Dutch, whose connection with it dates from 1660.

Celeomorphæ, a group of birds in Huxley's classification, containing the Woodpeckers and Wrynecks.

Celery, *Apium graveolens*, a British biennial umbelliferous plant, common near the sea. It has a strong, disagreeable smell, and is acrid and dangerous to eat when green in its wild state. In cultivation it is generally blanched by earthing up, and the leaf-stalks then form a favourite salad or are eaten stewed. Its fruits contain a larger proportion of the essential oil or essence of celery than the rest of the plant; but this essence is now prepared artificially. There are two races of celery, the red-stalked and the white-stalked, each comprising many varieties; whilst *celeriac* or turnip-rooted celery is a very distinct form, cultivated for the sake of its root in France and Germany. Celery is recommended as an anti-rheumatic.

Celeste, MADAME (1814–1882), a French dancer and actress, who passed most of her life in England and America. After studying dancing at the Royal

Academy of Music at Paris, at fifteen years old she went to the United States and met with much success. She there married a Mr. Elliot, and in 1830 she was in England, and played at Liverpool the part of Fenella in *Masaniello*. In 1834 she returned to America and was enthusiastically received, was made a citizen of the United States, and presented by President Jackson to his cabinet. In 1837 she came back to England, and abandoned dancing for acting, appearing first at Drury Lane and then at the Haymarket, and becoming manager of the Adelphi in 1844. She paid another visit to America (1865-68), and retired from the stage in 1874.

Celestine, a naturally occurring sulphate of strontium, SrSO_4 . It crystallises in white translucent, or transparent prisms of the rhombic system, or may occur in fibrous or granular masses. It is very brittle, and has a sp. gr. 3.9. It is found in a few localities in England and Scotland, in the Tyrol, Hungary, Pennsylvania, and Strontian Island.

Celestine, the name of five popes, the most notable of whom was Celestine V. (Pietro Morone), who, after being a hermit for sixty years, was, against his wish, elected Pope in 1294, an office for which he felt himself entirely unfitted. In a few months he abdicated, and his successor, Boniface VIII., put him in prison till his death, which happened in the next year. He was founder of the Celestines, now nearly extinct, an order of monks who follow the rule of St. Benedict.

[illegible]

Cell—elementary beings, as in the **METAPHYSICAL** observations.

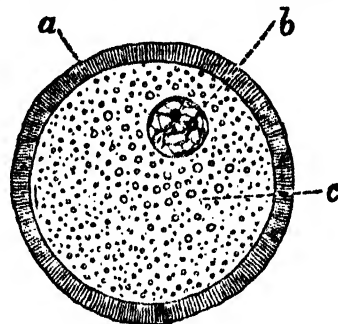
protoplasm and a *nucleus*, to which a cell wall is usually added. The protoplasm is really the essential part of a living cell. (For its composition, etc., see PROTOPLASM.) It is usually in two distinct layers, a clear, firm ectoplasm and a more fluid, granular endoplasm, containing food and oil materials. The nucleus is composed of a material known as *nuclein* or chromatin, arranged in a spiral or net, or as scattered granules, between which is the "nuclear fluid." The nucleus is an essential constituent of a true cell; when it is absent the structure is known as a "cytode." The simplest form of cell envelope is a mere hardening of the external layer of protoplasm produced by its dehydration; this is seen in some of the Amœbæ. In higher forms it is a definite cuticle, which may be often protected by a shell of varied composition. Among the Protozoa there are various types of cells, for which see PROTOZOA. Among Metazoa cells are still more varied, and build up all the complex tissues of higher animals. It is comparatively rare for the cells of animals to be limited externally by the hard, firm envelope of cellulose typical of plant cells; but in many cases it is impossible to say whether the cells are to be regarded as animals or plants: e.g. the "amœbulæ," which form one stage in the life history of the MYCETOZOA, or the "flagellulæ" of Proteomyxa. [GERMINAL CELLS, SPONGE.]

Botany. If we cut a cross-section of the young stem of a herbaceous plant and examine it even with a low power of the microscope, we see a mesh-like, or netted, chambered structure. A longitudinal section will be similar, though the chambers or cavities, filled with liquid contents, may be somewhat elongated. Robert Hooke, in 1667, compared this structure to a honeycomb, and first gave the name of cells to these chambers. The labours of Malpighi and Grew (1670) added much to our knowledge of the internal structure of plants; but, as was natural, these early observers took the solid wall of the cell to be the first-formed and most important part. Caspar Wolff, in the eighteenth century, maintained that the bodies of living beings are composed of minute constituent units all alike in early life and gradually differentiated into tissues; and in 1755 Rösé von Rosenhof, in his account of the "*Proteus animalcule*" (*Amœba*), gave the earliest description of what we now know as living protoplasm (q.v.). In 1772 Corti described the rotation of the contents of the cell in *Chara* (q.v.), and Meyen, that in *Vallisneria* (q.v.) in 1827. In 1835 Johannes Müller pointed out the existence of cells like those of plants in the notochord of vertebrate animals, and in the same year Dujardin carried out his important researches into that substance in the Foraminifera, for which he proposed the term "sarcodæ." Robert Brown's discovery of the nucleus in vegetable cells led to the recognition of the importance of that structure, and in 1838 Schleiden traced back the life-history of every plant to a single nucleated cell, and referred all the vegetable tissues to the cellular type. A year later Schwann extended this cell-theory of structure to animals, and in 1846 Hugo von Mohl discriminated the "tough, slimy, granular, semi-fluid"

protoplasm, or first-formed substance, from the watery cell-sap. It was found, however, that animal cells and many free-swimming vegetable cells (ZOOSPORES) were destitute of the cell-wall, so characteristic of ordinary plant-cells; that the cells of cork and wood, which had lost their protoplasm, had ceased to have any active vital functions; and in fact, as pointed out by Max Schultze, between 1854 and 1861, that, whilst Dujardin's animal sarcode is practically identical with Von Mohl's vegetable protoplasm, this substance is, as Professor Huxley termed it, "the physical basis of life," and we must replace the original idea of a cell, as a closed sac of membrane with a nucleus and fluid contents, by that of a unit mass of nucleated protoplasm. This botanists now generally term a primordial cell. In most cases it soon forms for itself a cell-wall, or becomes "encysted." In a number of the lowest plants single cells are capable of leading an independent existence, and perform all the vital functions, reproducing themselves either by bipartition, by sending out buds or even by conjugation. The "daughter-cells," resulting from one or more bipartitions remaining united, form a simple transition to colonies (*œnobia*), cell-filaments or tissues, from *unicellular plants*, that is, to multicellular ones. To some of the lower plants, however, no cell-theory can be applied without violence. The unencysted Myxomycetes (q.v.), and the large alga *Caulerpa* (q.v.), which has rhizoids, stems, and leaves, but no internal cell-partitions, are cases in point. In a typical young plant-cell the wall is thin and is completely filled by the contents, whilst the nucleus appears large relatively to the protoplasm. As the cell gets older the wall becomes thicker, the protoplasm becomes "vacuolated" by drops of watery "cell-sap," and the nucleus, remaining comparatively unchanged, appears relatively smaller. When the cell is mature, the cell-sap has often pushed the protoplasm to the sides, so that it forms a mere film, once termed the *primordial utricle*. The cell-wall consists mainly of cellulose (q.v.), $\text{C}_6\text{H}_{10}\text{O}_5$; but is possibly in all cases permeated by protoplasmic threads. In many of the higher plants the cavities of cells communicate by perforations. The cell-wall may, by saturation with *lignin*, *cutin*, or *mucin*, compounds richer in carbon than is cellulose, become converted into wood, cork, or mucilage respectively. The nucleus, apparently present at some time in all vegetable cells, is undoubtedly of great physiological importance. It generally divides before the cell undergoes division: if, in some algæ, it escape with some protoplasm from a broken cell, it may give rise to a new plant; and, as long as it remains, some protoplasm adheres round it. It has a delicate "nuclear wall," and differs from the protoplasm in its composition, apparently containing more phosphorus. The cell-sap is mainly water, but will contain sugar, dextrine, inuline, acids, or any other soluble substances that may be present in the cell. Besides the protoplasm, nucleus, and cell-sap and these soluble and, therefore, invisible substances, the cell may contain various granular bodies, such as aleurone-grains (q.v.), starch-grains

(q.v.), and *plastids*, of which the principal are *chloroplastids*, or chlorophyll-corpuscles (q.v.), *leucoplastids* (q.v.), and *chromoplastids*, or granules with less soluble colouring-matters. Needle-like or other crystals of calcium-oxalate or carbonate may also occur. [RAPHIDES.] Vegetable cells range in size from .001 millimetre up to a length of nearly two inches, as in the hairs of cotton.

Physiology. The human body with all its complexity of structure takes its origin from a single cell; every tissue of which the body is composed is made up of cells (more or less modified) the descendants of this original ovum. An idea of what a cell is may be obtained from a brief consideration of the mammalian ovum. It is a more or less spherical, semi-transparent, granular-looking body, from $\frac{1}{100}$ to $\frac{1}{200}$ inches in diameter. The substance of which it is composed is called *protoplasm* (q.v.), it is limited externally by a membrane called the *zona pellucida*, and contains, embedded within it, a distinct globular mass, known as the *germinal vesicle*. Substituting for the special term *germinal vesicle* the word *nucleus*, and neglecting the outer limiting membrane, we arrive at the conception of a typical animal cell.



RIPE OVUM OF CAT.

a, Zona pellucida; b, germinal vesicle; c, protoplasm.

The modifications such nucleated masses of protoplasm undergo in the making of the fully-developed human body are innumerable. In epithelium (q.v.) are found masses of cells in close juxtaposition to one another, as on the surface of the skin and mucous membranes; in the *connective tissues* (q.v.) the cells are cut off from immediate contact with one another by a development of intercellular substance; in muscle and in nerve the cells undergo remarkable modifications, so that the origin of such structures from cells is far from obvious at a first glance. To Theodor Schwann is due the demonstration of the cellular origin of all animal tissues; he showed that hairs, nails, and other (till his time imperfectly understood) constituents of the body, were composed of altered cells. The "cell theory" which Schwann thus put forward did not merely insist on the fact that the cell was the structural or morphological unit, it hinted at the feasibility of arriving at a just idea of the working of the body, by a study of the properties of cells, in other words it constituted the cell the physiological unit of the animal body. Virchow described the phenomena of disease from this point of view in his cellular pathology; to him is due the famous phrase, "*Omnis cellula e cellula*"—i.e. no cell originates save from a pre-existing cell.

From a structural standpoint it is noteworthy that certain modifications have been made in the idea of a cell. To the botanists is due the discovery of the cell, and hence the insistence in early times upon the cell-wall. Animal cells for

the most part have no well-marked outer limiting membrane, and so the nucleus came to assume the first importance. Nowadays it is the protoplasm that commands chief attention in the physiological conception of a cell; and with this change of view comes about an alteration in the attitude of physiology towards the cell theory. It is to a study of the physical and chemical properties of protoplasm, rather than to the particular structural features of individual cells, that the modern science addresses itself. In fact, the modern physiological unit is a limited mass of protoplasm, and not an organised cell. Hence the questions of movement, power of responding to stimuli, and nutrition, will be referred to under Protoplasm; a word may, however, be said here with regard to the reproduction of cells.

Cells may give rise to new cells by budding off a portion of their substance (gemination as it is called), by free cell-formation, or by division. The last-named method alone occurs in the human body. This division may be direct or indirect. In direct division no complex nuclear change precedes the splitting up of the cell, in indirect division the change does occur, and to it the terms karyokinesis and karyomitosiis, have been applied. To understand what is meant by these terms, it must be premised that the nucleus contains a network of fibrils. These fibrils are coloured by a large number of reagents which leave the interfibrillar substance unstained. Hence the name Chromatin is applied to the stain-retaining network, the interstitial substance being called Achromatin. By appropriate treatment of dividing cells it has been shown that cell division is very generally preceded by a complex set of rearrangements of pattern in the nuclear network. To the figures formed by the fibrils, such terms as rosettes, wreaths, spindles, etc., have been applied, and the whole process has been called karyokinesis (*karyon*, a kernel, *kinesis*, motion; or karyomitosiis, *mitosis*, the nucleus, *mitosis*, rounded bodies, to be seen. Their exact nature is doubtful. Some portions of the cell are lying free in the chemical composition investigated and a substance isolated and described.

The "germ plasma" theory of Weismann, which holds that the cell in reproduction is derived from the nucleus. This theory is also contained in the cell theory.

Cell. Each of the following compounds:—
Cellulose, a substance in dilute solution in water, is a white, fibrous, and insoluble substance.
Cellulose, a substance in dilute solution in water, is a white, fibrous, and insoluble substance.

partly remedied. *Bichromate*, zinc and carbon in a solution of bichromate of potash and sulphuric acid; E.M.F. 2.3—1.7 volts.

(B) Compound Cells: *Daniel*, zinc in dilute sulphuric acid, or zinc sulphate, copper in saturated solution of copper sulphate; E.M.F. about 1.1 volts and constant. *Grove*, zinc in sulphuric acid, platinum in strong nitric acid; E.M.F. about 1.9 volts and constant; resistance low. *Bunsen*, similar to the Grove cell, but with carbon stick in place of the platinum. *Leclanché*, zinc in solution of sal-ammoniac, carbon stick imbedded in a mixture of powdered charcoal and black manganese-oxide; E.M.F. about 1.5 volts, diminishing rapidly when in use, but recovering if left to itself; very little attention required. *De la Rue*, zinc in chloride of zinc solution, silver in fused silver chloride; E.M.F. 1.046 volts and quite constant. *Latimer Clark's Standard Cell*, mercury and zinc with mercurous sulphate paste; E.M.F. 1.436 volts.

(C) Secondary Cells: *Grove's Gas Battery*, platinum electrodes in dilute sulphuric acid with hydrogen and oxygen gas evolved at the two poles; E.M.F. 1.47 volts. *Planté*, lead electrodes in dilute sulphuric acid, with surfaces specially prepared by repeated charges in alternate directions; modifications by Faure, Sellon, and others; E.M.F. 2.22—1.96 volts; resistance extremely low.

Cellepora is the type genus of the *Celleporidae*, one of the families of the Bryozoa, or "moss animals," and belonging to the sub-order CHEILOSTOMATA. It is a genus that includes many British species both living and extinct. It forms large thick encrusting or arborescent masses, which in general appearance resemble corals more than do any other members of this group.

Cellini, BENVENUTO (1500–1569), a celebrated Florentine engraver, sculptor, goldsmith, author, and madman. The son of a Florentine musician and musical instrument maker, he displayed an early taste for metal-work, and his father apprenticed him to a goldsmith. At an early period of youth his zeal for battle and murder caused him twice to leave Florence and go to Rome, where, on his second visit, a vase that he made, and a medallion, *Leda and the Swan*, brought him to the notice of Pope Clement VII., who made much of him, and when in 1527 the Constable de Bourbon attacked Rome Cellini's love of fighting brought him into great prominence. Among other feats he, according to his own account, killed the Constable and wounded the Prince of Orange. Shortly afterwards he became reconciled to the authorities of his native place and returned to Florence, where he engraved medals, among them being *Hercules and the Nemean Lion*, and *Atlas Supporting the World*. After a visit to Mantua he returned to Florence and again went to Rome, whence, after killing one man and wounding another, he had to flee to Naples. But on the accession of Paul III. he was back in Rome restored to full favour. He had, in the meantime, amused himself by killing another man, and soon, from causes that are not quite clear, he had to leave Rome, to be restored once more, and to be imprisoned, after a visit to the court of

Francis I., upon a charge of stealing jewels from the Pope's crown. He escaped, was recaptured, and was in danger of death, but powerful intercession saved him, and he went again to France and worked for a time for Francis I. Court intrigues led to his retirement from the French court and his return to Florence, where he devoted himself to art under the patronage of Cosmo de Medici. It was during this period that he produced his famous bronze of *Perseus with the Head of Medusa*, a work whose production cost him vast pains, and brought him a corresponding amount of fame and honour. It was in 1558 that he began to compose his memoirs, a book of great value, both as presenting a vivid picture of Italy of the Renaissance, and as being a wonderful piece of self-dissection. His frankness, and his entire absence of shame or reticence, remind the reader of Jean Jacques Rousseau and his *Confessions*, and make his book a delightful study to the student of human nature. The English translation by Roscoe is well worth reading. He wrote also treatises on various points of his art; and produced many other notable works of art, some of which have perished.

Celluloid is formed by well mixing gun-cotton and camphor. The mass becomes plastic and easily moulded when warm, hardening again on cooling. May be coloured by the addition of pigments to the constituents before mixing; and by pressing together differently coloured varieties, it may be obtained of a marbled and mottled appearance. It is largely used as a substitute for horn or ivory, and for the manufacture of imitation tortoise-shell, coral, or malachite articles.

Cellulose. The membrane forming the walls of plant cells, and which generally forms the framework of all vegetable tissues, is, in all cases, composed chiefly of the same chemical substance, termed *cellulose*. Cotton wool, elder pith, hemp, etc., consist almost entirely of cellulose, which may be obtained pure from any of these sources by removing the impurities by different solvents. When so obtained, it is a white solid, insoluble in water or alcohol, but soluble in strong sulphuric acid, which converts it into sugar. If pure it is stable, but in the presence of other vegetable matter it soon decomposes. Its chemical composition may be represented by $(C_6H_{10}O_5)_n$, the exact complexity of the molecule being unknown. By treatment with concentrated sulphuric acid it may be entirely converted into *grape-sugar* ($C_6H_{12}O_6$), a process by which sugar or brewing and other purposes is largely manufactured from linen-rags or other refuse. When acted upon by a mixture of nitric and sulphuric acids, cellulose is converted into nitrates, known as *nitro-cellulose* or *cellulo-nitrins*, of an explosive character, of which *pyroxylin* or *gun-cotton* (cellulotrintrin), $C_6H_7O_2(NO_3)_3$, is the best known. *Collodion* is a solution of similar nitrates in alcohol and ether. Though cellulose does occur as a rare substance in the animal kingdom, it is more especially characteristic of the vegetable cell, and the cellulose walls can be seen to be formed by nascent or "primordial" cells out of the protoplasmic substance, in the metaspERM of the date-palm, and probably

in other cases, cellulose occurs as a reserve substance, the cell-walls being thick in the ripe seed and thinning during germination. More commonly the walls of old cells undergo one of three changes, becoming impregnated with lignin, cutin, or mucin, substances richer in carbon than is cellulose. In the first case, *lignification*, characteristic of wood-cells, the wall becomes less plastic, less permeable, hard, and susceptible of a distinct yellow coloration by iodine alone and brown with sulphuric acid. In the second case, *cuticularisation*, characteristic of cork and cuticle, the wall becomes elastic, impermeable, and non-absorbent, and offers great resistance to the action of even strong acids. It becomes yellow on treatment with iodine and does not swell, as do unaltered or lignified walls, on treatment with sulphuric acid. The third case, conversion into mucilage, as in the testa of linseed, renders the walls extremely absorbent, swelling considerably with water. These three changes are known compendiously in German as *verholzung*, *verkorkung*, and *verschleimung* respectively.

Celosia, a genus of *Amarantaceæ* (q.v.), of which the best-known is *C. cristata*, which is familiar in cultivation in the monstrous form known as a cockscomb, in which the flowering branches are united or *fasciated* into a broad flat mass, covered with the crimson or yellow membranous flowers.

Celsius, ANDERS (1701-1744), a Swedish astronomer, born at Upsala of a somewhat noted family, since his grandfather was a professor of astronomy and a decipherer of Runes, and his uncle professor of theology and author, and the friend and patron of Linnæus. Celsius became professor of astronomy at Upsala in 1730, and in 1736 took part in the scientific expedition of Maupertuis for measuring a degree of the meridian in Lapland. He published an account of the results of this expedition, and wrote many papers upon astronomy and physics, and from 1740 presided over a good observatory, which was erected at Upsala. He is known also as the constructor of the centigrade thermometer, which, as its name implies, is divided between boiling and freezing points into 100 degrees, and is generally accepted for all scientific purposes as the standard thermometer. One of Celsius's theories was that the waters of the ocean are decreasing in volume.

Celsus, a philosopher who is thought to have probably lived somewhere in the latter part of the second century A.D., and who wrote an attack upon Christianity, our sole knowledge of which attack is derived from a criticism upon it by Origen, who was appointed by Ambrosius to examine and refute it. His method of doing this was to quote the passages at length, and examine them in detail, and thus he gives us a more or less clear idea of Celsus's work. Celsus is thought by some to have been identical with a Celsus who was an epicurean and the friend of Lucian, but this seems improbable, since this Celsus speaks contemptuously of Plato and his school, whereas our Celsus was distinctly Platonic in his doctrines.

His attack upon Christianity resembles in many points the criticisms of the present day. In the first part he criticises it from the supernatural point of view, as it might present itself to the few whom he introduces, and into whose mouth he puts his criticisms, and endeavours to show its inherent improbability, if not impossibility. In the second part he criticises it from a philosophical standpoint, and tries to demonstrate that it is unphilosophical, unwise, illogical in the inconsistency of its spiritual and anthropomorphic aspects, and absurd in supposing that God cares more for the few than the many, or more for one part of creation than another.

Celt, a generic term, now obsolescent, for stone implements shaped like chisels and used as cutting instruments. The word is derived from what is generally considered to be a pseudo-ablative Latin form, *celte*, in the Vulgate (Job xix. 24) translated "with a chisel." No other form of the word is known, so that it is probably a miswriting for *certe* = certainly, verily—corresponding to the "forever" of the Authorised Version. [FLINT IMPLEMENTS, NEOLITHIC, PALÆOLITHIC.] The term has been extended to include implements and weapons of the Bronze Age (q.v.), which were at first copies of, and then improvements on, those of the earlier races, for metal was capable of being worked into shapes which the stone would not admit of.

Celtiberi, an ancient Spanish race sprung from a mixture of Celts and Iberians. They occupied an inland district, south of the sources of the Guadalquivir, and between the Ebro and the sources of the Tagus, Ebro, and Guadiana. They consisted of four tribes, and were famous as cavalry and infantry. They held their own in dress and manners as late as 72 B.C. Their chief towns were Legobriga, Bilbilis, the birthplace of Martial, and Numantia, destroyed by Africanus in 133 B.C.

Celtic Language, one of the first to be known, and which holds a position between the Aryan and the Teutonic, but with closer relations to the former than to any other. From the Aryan family it has already found split into two branches, which differ more from each other than, for instance, the high and low German of the Teutonic branch. The Celtic language, *Gadhælic* (Gaelic) and *Kymric* (Welsh), has been spoken throughout the history of their people, and of the regions in which they migrated to the extreme west of Europe. Its phonetic and grammatical forms, lying in both the Aryan and the Teutonic tongue, show the organic growth of the language, which has been preserved in the Aryan languages, and the Kymric (Welsh),

answering to the Gaelic *mac* (son), as in Macdonald, MacConnell, etc. So, also, Gaelic *cen* (pron. *ken*, head), as in *Kin-sale*, becomes *pen*, *ben* in Kymric, as in the Italian *A-pen-nines*, the Portuguese *Pen-inha*, and the British *Pen-nines*, all meaning *white* (snowy) *head*. These and similar examples, such as Ben-Lomond, Ben-Nevis, Penryn, and the word *pempedula* (quinquefolium, cinque-foil), preserved from the old Gaulish of Central France, show that the Kymric-speaking peoples were more widespread than the Gaels, or else that the latter were displaced by the former, as happened in Wales, Cornwall, and South Britain generally. The reverse process took place in North Britain, where the Picts (Kymric) were gradually displaced by the Scots (Gaels from Ireland). Including the Gaulish, which survives in a few scarcely deciphered inscriptions, the two groups comprise altogether seven members as under:—

GADHÆLIC.	Irish, chiefly in Connaught and West		
	Munster	..	880,000
	Erse (Gaelic), Scottish Highlands	..	230,000
	Manx, Isle of Man	..	2,000
KYMRIC.	Gaulish, Central France, extinct		
	Kymraeg (Welsh), Wales and Monmouth	..	950,000
	Cornish, Cornwall, extinct	..	—
	Brezonek (Low Breton), West Brittany	..	600,000
Total of Celtic speech (1890)			2,662,000

Throughout the historic period Celtic speech has been continually yielding to the other members of the Aryan family, and especially to the Italic and Teutonic. Since the second or third century of the new era it has ceased to be heard in Asia Minor, where it had been introduced by the Galatians (Gauls) in 278 B.C. It has long been extinct in Bohemia, Switzerland, North Italy, and (except Brittany) in France, in all of which regions it was current less than 2,000 years ago. In the fifth and sixth centuries it surrendered most of its British domain to the Teutons (Angles, Saxons, Frisians, etc.), and in the tenth century was driven by the Norsemen from Iceland, which island is known to have been first peopled by immigrants from Ireland. It disappeared from Cumberland ("Land of the Kymri") two or three hundred years ago, and died out in Cornwall towards the close of the 18th century. Since then its territory in Wales has remained somewhat stationary, but in Scotland and Ireland has been greatly contracted. Gadhælic was reduced to writing probably in Pagan times, and written in the so-called *Ogham* character, which in Ireland was replaced with the introduction of Christianity in the 5th century by an alphabet of sixteen letters derived from the Roman. Kymric has always been written in the Roman, and its earliest extant literary monuments, if glosses can be called such, date from the 8th or 9th century. Gadhælic, which possesses a copious literature (poetry, chronicles, legendary history, religious treatises), has almost ceased to be written for the last 200 years, and of all Celtic tongues Kymraeg alone continues to be cultivated (poetry, periodical literature, religious tracts, miscellaneous writings). It will probably survive, a last fragment of primæval Celtic speech, long after the

elder branch has died out. Thanks to the ease with which compound words are formed, both are extremely rich, full of poetic imagery, sonorous and even musical, despite the uncouth appearance of their orthographic systems. This is due to the marked predominance of the vocal and liquid sounds over the consonants, which are themselves uttered more softly or carelessly than in any other Aryan language. Between vowels they tend to become aspirated (mere breathings), and so to disappear, thus giving rise to great contraction and to a highly developed diphthongal series (eleven in Irish besides triphthongs). Hence many subtle laws of euphony, such as the vocal principle of "broad to broad and slender to slender," requiring every consonant or combination of consonants always to stand between two broad (*a o u*) or two slender (*e i*) vowels. Hence, also, initial modifications, especially in verbal inflection, which is further complicated by an elaborate system of primary and secondary tenses, active and passive voices, prefixes, infixes, and postfixes, rendering the verb a formidable obstacle to the student of the Celtic languages. The system is of vast antiquity, for it is common to both branches, and taken in connection with the intricate phonetic laws serves to distinguish Celtic speech in a very marked manner from all other divisions of the Aryan family.

Celts (Lat. *Celtæ*, Gr. *celtai*), a great Aryan-speaking nation of antiquity, who still form a constituent element of the populations throughout South-Central and West Europe and the British Isles; first mentioned by Herodotus, who places them in the extreme west, and "beyond the pillars of Hercules." But Plutarch extends their domain from the Palus Mæotis (Sea of Azov) to the Atlantic, and there can be no doubt that in the course of their migrations, probably from the Russian steppes up the Danube Valley westwards, they made more or less permanent settlements in Bohemia, Helvetia, North Italy (Gallia Cisalpina), and many other intervening lands. But shortly before the new era the bulk of the Celts proper appear to have been already confined mainly to Central Gaul between the Garonne and Seine (Cæsar's Gallia Celtica), and to the British Isles. They were not, however, the first inhabitants of these regions, which had already been occupied by men of the early and later stone ages (pre-glacial and post-glacial epochs), who were partly exterminated, partly absorbed, by the intruding Celts. And thus began that intermingling of races long before the dawn of history, which, combined with the one-sided and often antagonistic theories of anthropologists, philologists, antiquaries, and national prejudice, has tended to involve Celtic ethnology in almost hopeless confusion. The word Celt itself has received as many meanings as the standpoints from which it has been studied, while the secondary or associated terms Galli, Belgæ, Britanni, Picts, Scots, Gadhælians, and Kymrians, are differently interpreted according to the different views or sentiments of British, Irish, and Continental writers. These questions cannot

here be discussed; but those who desire to approach their study with unbiassed minds should at least keep in view the first principles of anthropology, as, for instance, that race and language are not convertible terms, consequently that all peoples now or formerly speaking Celtic idioms are not necessarily Celts. From the remotest times the Celtic language was already split into two main divisions. [CELTIC LANGUAGES.] But it would be absurd to conclude from this that the Celtic race was also split into two distinct physical groups. Being admittedly a branch of the primitive Aryan stock [ARYAN RACES], the early Celts could present but one physical type, that common to the other early Aryan peoples, until they became modified by later interminglings with non-Aryan populations. Owing to these interminglings there are now not one but several physical varieties, which seem to have but little reference to the two varieties of Celtic speech. In Ireland alone there are the *dubh* ("black") and the *ruadh* ("red"), both speaking the same Gadhælic form of Celtic. So in France and Belgium we have the small, dark, round-headed Savoyards, Auvergnats, and Bretons, quite different from the tall, fair, long-headed Walloons, some speaking neo-Latin tongues, some the Kymric form of Celtic, but all alike supposed to be "Celts." Here, however, some French anthropologists (Broca and his school) distinguish two types, the Celtic proper (Cæsar's Celtæ) represented by the dark Auvergnats and Bretons, and the Gallic (Cæsar's Belgæ) represented by the fair Walloons. But thus to separate Gauls from Celts is already sufficiently embarrassing, and the same irreconcilable dualism is met in the whole field of Celtic ethnology. Its cause lies in the primitive dual elements (dark and fair) of the Caucasian race itself [CAUCASIAN RACE], the explanation being that after separating from the parent Aryan stem, the Celts (originally tall and fair) became more or less assimilated to the dark non-Aryan peoples of Central and West Europe, on whom they imposed their Aryan speech. Hence the primitive Celtic man has been mainly effaced or absorbed in the Ligurian, Silurian, Iberian, and other primitive European populations, and little remains except the primitive Celtic speech.

Cementation Process, a process used for the conversion of wrought iron into steel. The iron is placed in the form of straight bars in the part of the furnace known as the "converting box," and surrounded completely by charcoal, the whole being plastered over. It is then heated strongly for from seven to ten days, until the carbonisation of the iron has proceeded sufficiently. The bars are then reformed. The action seems to be due to carbonic oxide formed, and not to the direct union of the carbon and iron. The process has been known from very early times, but is now, however, completely supplanted by the Bessemer process (q.v.). [IRON.]

Cements, a class of substances used to rigidly connect two bodies by forming a firm layer between, which strongly adheres to both. They may be divided into two classes :—(1) Building cements and

(2) adhesive materials. The second class of cements, adhesive materials, are very numerous, and different in their characters. They may be divided into (a) resinous cements, which soften by heat and harden on cooling, as sealing-wax, marine glue, etc.; (b) solutions of substances which harden on exposure, owing to the evaporation of the solvent, e.g. Canada balsam, caoutchouc dissolved in chloroform, etc.; (c) mixtures containing oils, which harden owing to oxidation, putty, white lead; (d) substances which soften by the action of water and harden owing to the absorption of the water by the cemented materials, e.g. paste, glue, liquid glues, etc.

Until the introduction of Roman cement, only well-burnt stone lime was employed. Thus the mortar in ordinary use is a paste formed by mixing water with one part of slaked lime and three or four parts of sand, the most suitable proportions of these constituents varying with their quality. The purer limes are not so efficient. The hardening is perhaps due to the evaporation or other loss of the water, and to the formation of calcium carbonate by combination of the lime with the carbonic oxide in the air.

Roman Cement is formed by calcining certain mixtures of lime and clay, which occur in the newer geological formations; the burnt material is ground and sifted, and used with about an equal weight of sand. It is generally quick-setting, and is therefore useful in tide-works or other cases where rapid hardening is necessary. Though not very strong, it may form a good hydraulic cement, that is, one which hardens under water, when clay makes up half its weight. All hydraulic cements require at least 10 per cent. of clay.

Portland Cement is formed by calcining to a fine powder a mixture of Portland stone, is a mixture of Portland stone and clay. It is used in many cases, and is stronger than Portland stone, in the construction of bridges, harbours. Many failures have occurred, but time is required to test the strength of a bad manufacture of the Portland. The processes. The following are the processes of the Thames or Portland cement, and river clay are mixed in the proportion of three parts of chalk to one of clay, and reduced to a thick, cream-like paste in a water-wheel. The mixture is then the surface of the wheel is covered with heating, and the mixture is then dried in dry places, and then burnt, and then mixed with water, and then the cement is mixed with a little sand, and then sets stronger, and then is stronger, and then is complete.

Plaster is a compound of gypsum, and is used for plastering walls, and for making casts, and for making models.

Rust Cement is formed with iron parings and sal-ammoniac. It is useful for joints in ironwork.

Sulphur Cement is made of sulphur, resin, and brick-dust; it is best adapted for earthenware joints.

Sodium-silicate and fireclay or asbestos powder form a heat-proof cement. For other cements see WHITE and RED LEAD, SHELL-LAC, GLUE, and ISINGLASS.

Cement Stone, a limestone, earthy and ferruginous, and containing an admixture of clay and often sand. When burnt, so as to convert the carbonate of lime in it into quicklime, this rock yields a hydraulic cement. A tolerable hydraulic limestone contains 10 per cent. of insoluble matter in addition to carbonate of lime; but one with 20 to 30 per cent. is better. The lias is our chief source of cement-stone; but the calciferous sandstone series (q.v.) of Scotland, the septaria (q.v.) from the London and other clays, and the ironstone known as "curl" in Coalbrookdale, are also of importance. More of our hydraulic cements are, however, manufactured by the admixture of ingredients than by calcination of natural limestones.

Cemetery (Greek *koimeterion*, sleeping-place), a burial-ground not around a parochial or other church, or sometimes (loosely) a churchyard. [BURIAL.]

Cenci, the name of a Roman family made partly famous and partly infamous by the tragic story of Beatrice Cenci, commemorated in the beautiful portrait, said to be the work of Guido Reni, and by the tragedy of *The Cenci*, written by Percy Bysshe Shelley. Francesco Cenci (1527-1598) was one of those characters sometimes produced by high material civilisation, who are gods to themselves, and permit themselves unbounded licence, and who are as free from all moral rule as the old Greek gods themselves. He was rich, brave, and intellectual, and these three qualifications saved him often from the consequences of his perverted sensuality. Among his vagaries was the conception of an intense hatred for the children of his first marriage, and he so persecuted his three sons that they petitioned the Pope to make an end of their father. But Francesco's money saved him. Of his two daughters the elder petitioned the Pope to let her retire to a convent; and the Pope was so far moved with pity that he provided her with a husband, and forced her father to give her a large dowry. Furious at this, the father shut up Beatrice, who was then 14; and during this confinement he is said to have fallen in love with her, and to have outraged her. But a Cardinal Guerra had also fallen in love with Beatrice, and consulted with Beatrice and her step-mother Lucrezia, and the survivor of the three brothers—Giacomo—how they should dispose of this model father, since a new petition to the Pope had no effect. At last it was arranged that the old villain should receive an opiate, and while he was under the influence of this, Beatrice introduced two assassins into his room, who drove a couple of nails, one through the sleeper's eye into the brain, and the other through the throat. The daughter

and stepmother withdrew the nails, and dragged the body to a gallery, and threw it into the branches of a tree, so that it should appear that the old man had accidentally fallen from the gallery. It was some time before suspicion was aroused, and the clues followed up which revealed the deed and the doers. The Pope had found it easy to deal gently with the criminal father, but felt compelled to resist all prayers for pardon for the two maddened women. Beatrice and her stepmother were beheaded, Giacomo was killed with a club, and Bernardo, the youngest brother, was put into a monastery.

Cenotaph (Greek *cenos*, empty, and *taphos*, a tomb), a monument erected to a person buried elsewhere.

Censer, a vessel for burning incense used in ancient times by Pagans, and by the Hebrews in the service of the Temple, and in the Christian Church. The present form of censer used in churches is a kind of vase suspended by chains for convenience of swinging, and so diffusing the fragrance of the incense, which is scattered upon live charcoal in the vase, and covered by a perforated lid to prevent the burning substances from falling out.

Censors, two officers of the Roman state whose duty it was in the first place to check and regulate the census or list of citizens, a duty which, as it involved the removal from the list of unworthy citizens, caused them to become in time the dreaded arbiters of morals and manners. They were elected by the *Comitia Centuriata*, originally for five years (called a *lustrum*) and afterwards for eighteen months. They were the highest officers of the state except the Dictator, and had vast equitable powers. They had also charge of the public revenues and of public works. Till 351 B.C. they were always patricians, in 339 B.C. it was enacted that one of them should be a plebeian, and in 131, for the first time, both were plebeians. The magistracy was abolished by Sulla, and though restored shortly afterwards never recovered its position. We last hear of it under Augustus in B.C. 32. After this its powers were absorbed by the emperor.

Census (Latin *census*; cf. *censo*, I estimate), in ancient Rome a registration of the heads of families with their landed property, intended to serve as a basis for taxation and the assignment of various degrees of political power. The first census was that of Servius Tullius. The list was revised at stated periods by the CENSORS (q.v.). Under the later Roman Republic and the Empire the census was a record of the population of a province with their landed or other property, intended to furnish data for fixing the tribute to be paid by the province (cf. Luke ii. 1-3).

Between the fall of the Roman empire and the end of the 18th century there was no general enumeration of the people of any European country. The desirability of it, from the economic point of view, was hardly seen, and had it been seen, religious scruples, due to the punishment of David for numbering Israel (2 Sam. xxiv.), would doubtless have interfered. There were, however, occasional partial enumerations of the populations

of certain districts under the despotic governments of the Continent. The first census, in the modern sense, in Great Britain, was taken in 1801, and it has been repeated ever since at intervals of ten years. The first census of Ireland was taken in 1811, but was very inaccurate, as was also that of 1821. The establishment of a uniform registration of births, deaths, and marriages, in Great Britain in 1837, and the creation of the Royal Irish constabulary, provided better means of correct enumeration. Information on agriculture was first collected in Ireland in 1841. A religious census is taken in Ireland, and was carried out in Great Britain in 1857, but the objections of the Non-conformists, based on the fear that almost all persons whose creed was doubtful would be ranked as members of the National Church, have prevented its repetition in Great Britain. At every census additional particulars have been taken. The Census Act, 1900, required that the census of 1901 should show "the name, sex, rank, profession, or occupation, condition as to marriage, relation to head of family, and birthplace of every living person who abode in every house on the night of Sunday, the 31st of March, 1901, and also whether any were blind or deaf and dumb, or imbecile or lunatic."

The first census of the British Empire was taken in 1871, when the population was found to be 234,762,593; in that of 1901 the population is given as 400,543,713.

In the United States a census has been taken every ten years from 1790, and an intermediate census is taken every five years. The particulars noted are very minute and various, and relate to agriculture, mining, and various branches of industry, as well as to the population. Some offence was caused at the 1890 census by a query addressed to the landowners as to the mortgages (if any) on their property. There is reason to believe, unfortunately, in some of the more backward states the enumeration has at times been very defective, and the appearance of a large increase in the negro population between 1870 and 1880 is now attributed to the defective enumeration of the former year.

On the Continent of Europe censuses are usually taken at intervals of ten years. The last census of France, taken every five years, was in 1906, that of Germany, also taken every five years, in December, 1905.

Cent, in the United States and Canada, the 100th part of a dollar (q.v.), about equal in value to $\frac{1}{4}$ l. sterling. The Dutch florin, value about 1s. 8d., is also divided into 100 cents. The *centime* of France, and the *centesimo* of Italy, are each the 100th part of a franc. The word cent. is also used as an abbreviation of the Latin *centum*, 100, as in the phrase "the Three per Cents."

a Centauri, a brilliant star in the southern celestial hemisphere, invisible in these latitudes. It is second in brightness to Sirius. Its parallax was first determined at the Cape of Good Hope by Henderson, and its distance from us found to be approximately thirty billion miles.

Centaur, historically, were probably a mounted race of hunters in Thessaly—a kind of Gaucho of



CENTAUR.

olden times. Homer mentions them as "gigantic, savage, and covered with hair," and by Pindar's time they had reached the mythological stage, and were become half man and half horse. Centaurus, their father, was represented as the son of Ixion and the cloud, and their mothers were mares. They are spoken of as having fought with the Lapithæ at the marriage of Peirithous with Hippodamia, and with Hercules. The most noted of them was

Chiron, who was the instructor of Achilles.

Centenary (Latin, *centeni*, the distributive adjective from *centum*, a hundred), the celebration of the hundredth anniversary of any event. Such celebrations have been common of late years. Thus the centenary of the United States Declaration of Independence was celebrated in 1876, and the tercentenary of Shakespeare's birth in 1864.

Centering, the frame or mould used in the construction of arches, for the support of the during the course of their formation. [BRIDGES.] If the piers are not required during its construction, it may be built to support the arch, facilitating its simple construction. Piers are undesirable, as they leave head-room above the arch. Then the design is drawn, showing the spans. The beams must be stressed in them are for the arch. The structure must be complete arch, and must support the deadweight of the bridge upwards. The centres are set at a certain height above the arch, and the arch is sunk at the ends, so that the mortar is well

Centigrade, a scale of temperature, introduced by Anders Celsius. The range of the point of water pressure, is from 0° to 100°. Freezing point, 0°. Centigrade represented

Temperatures below the freezing-point of water are negative; thus the freezing-point of mercury is expressed -40° C. The Fahrenheit scale (q.v.) is more generally used in England, except among scientists; the Centigrade scale is used all over France, and the Réaumur (q.v.) in Germany. [TEMPERATURE, HEAT.]

Centimetre, a unit of length, the hundredth part of a *mètre* (q.v.). Its value in English measure is $\frac{1}{25.4}$ of an inch, which is between $\frac{1}{4}$ ths and $\frac{1}{2}$ ths of an inch; either of these fractions may be taken as an approximation. A cubic centimetre of pure water at 4° C. has a mass of one gramme, or very nearly so. A litre of pure water, or 1000 cc., weighs, therefore, one kilogramme. [METRIC SYSTEM.]

Centipede is the popular name for one of the animals belonging to the Chilopoda, one of the orders of the Myriapoda. They are all land animals, generally of small size, with an elongated body, somewhat flattened from above downwards, composed of a series of similar segments, and with one pair of legs to each segment. They breathe by tracheæ or tubes ramifying through the body. They have a powerful pair of poisoned claws. As Myriapods they belong to the great phylum Arthropoda (i.e. having jointed limbs), and among the members of this group agree most closely with the Insects. The Centipedes especially support this alliance by the remarkable genus *Scolopendrella*, which is by some authors placed among the Insects in the class Thysanura. It may be roughly described as an insect with many similar segments, having limbs on the abdomen. The British centipedes are harmless, and generally small, rarely more than two inches in length. *Lithobius forficatus* is the commonest British species. The Centipedes differ from the Millepedes, which form the second important order of the Myriapods, in that the antennæ have more than fourteen, and rarely more than forty, joints, and that they have one pair of limbs to each segment, instead of two as in the Millepedes. The Centipedes also have a large "basilar" segment behind the head composed of several fused segments. The earliest Centipedes have been found in the Carboniferous period.

Centlivre, SUSANNAH (1667–1723), a dramatic writer, born in Ireland, the daughter of a Lincolnshire gentleman named Freeman, who had been a Parliamentarian and so was obliged to quit England at the Restoration. His orphan daughter came to England and married at 17. Her husband dying in about a year, she married an officer who was killed in a duel before they had been married two years. His widow then took to acting and play-writing with much success, and her wit and attractions brought her to the notice and friendship of Farquhar, Rowe, Steele, and other distinguished men. In 1706 she married Queen Anne's head cook, a Mr. Joseph Centlivre. Among her best known works are *The Busybody* and *A Bold Stroke for a Wife*.

Cento (Lat. *cento*, *centonia*, a patchwork; apparently from Gk. *kentron*, in the sense of a *pin*), a composition consisting of lines taken from various

places in the works of one or more authors, so arranged as to make a poem with a continuous sense. Such "centos," especially from Virgil, were a common exercise of ingenuity in the later periods of Latin literature. The term is also applied to sets of musical selections.

Central America. [AMERICA.]

Central Attraction. When a body is moving under the action of a force which is continually directed towards a fixed point it is said to be subjected to a central attraction. If this is the only force acting on it, the path described by the moving body is said to be a *central orbit*. Approximate examples occur in astronomy; the earth describes a central orbit round the sun, towards which it is continually being attracted by force of gravity. In a case like this the body moves in such a way that the line joining it to the centre of attraction sweeps out equal areas in equal times. This applied to planetary motion is one of Kepler's laws, determined by observation.

Central Criminal Court. A court for the trial of treasons, murders, felonies, and misdemeanours, committed within the City of London, and county of Middlesex, and certain parts of Essex, Kent, and Surrey, and on the high seas. It was constituted by an Act of Parliament passed in the year 1834, and its sessions are held at least twelve times in every year.

Centralisation, the transfer of administration from local authorities to some department of the central government of a state. As a rule, the tendency to this transfer has increased with civilisation; and an analogy to it has been found in the increasing dependence of the whole body upon the brain, the higher we look in the scale of animal existence. In the earliest type of large states, the "tax-taking empires," such as the Assyrian and Persian empires of antiquity, the rulers demand contributions of men and money from their subjects, but hardly interfere at all in their local affairs. The dominion of ancient Rome, until the second century of the Christian era, was, in theory, a group of peoples, mostly either organised in city-communities or destined to be so organised when they should be sufficiently civilised under the presidency of the Imperial city, Rome. Their liberties were very various, and in most cases subject to interference from the Roman government. But, in theory though not in practice, this interference was occasional and temporary. The rise of a trained Imperial bureaucracy (q.v.) and the frequent incapacity of the local authorities, especially in finance, gradually tended to throw the supervision of all details of local administration into the hands of the Imperial authorities at Rome. The great monarchies of modern Continental Europe, having arisen on the ruins of the feudal system and by the absorption of many separate states, have tended of necessity to substitute central for local control of administration. The tendency has been aided by the improvement of means of communication, and in past times by the theory (best seen in Russia to-day and in the France of Louis XIV.) that all power centres in the monarch, and it is his duty as God's

vicegerent to see that all goes right among his subjects. The writers of the French revolutionary school, again, were mostly desirous of a strong central government to crush the apparently irrational anomalies existing in different parties of France. All over the Continent, therefore, administration is very greatly centralised, though a reaction is of late years perceptible in France, and the Federal structure of Switzerland partly prevents the tendency from being fully realised. In England there has never been the practical necessity for unifying the nation, which has been felt in Continental countries, nor has a despotic Government arisen analogous to theirs. Still there has been tendency to control local bodies by Government departments, the creation of the Poor Law Board in 1834, of the Local Government Board, of the Committee of Council on Education, and, more recently, the transfer of local prisons to the Home Office being conspicuous instances. But of late years a counter-tendency has arisen. The concession of representative government with almost complete independence to Canada and the Australian Colonies, the movement for Home Rule in Ireland, the establishment of County Councils, and District and Parish Councils are examples of this latter.

Central Provinces, a part of India administered by a Chief Commissioner, and lying between lat. 17° 50' and 24° 30' N. and between long. 76° and 85° E., with an area of over 100,000 square miles, and containing eighteen British districts and fifteen native states. The territory consists of a series of alternating tablelands and plains intersected by rivers, and in the south is a rugged hill and forest land—the wildest part of the peninsula. The chief commissioner-ship consists of four divisions—Nagpur, Jabalpur, Nerbudda, and Chatisghar. In the N. the Nerbudda separates the Vindhyan and Satpura tablelands; then comes the Nagpur Plain, having the Chatisghar Plain to the E., and beyond that a wild forest-land extends almost to the Godavery. Owing to the rugged formation of the country, and the rapid slopes, the Nerbudda and other rivers have all the character of mountain torrents. The great feature of the Central Provinces is the great and rapidly recurring variety of the soil and vegetation. The Nerbudda Valley is occupied by beautiful corn-lands, and the wilder uplands are studded with spots of high fertility, where sugarcane and opium are largely cultivated. The Nagpur Valley produces rice, and cotton and tobacco are also cultivated. Coal and iron are also found, but the coal is not of good quality. The population is chiefly rural, but there is some weaving and smelting and working of iron. The inhabitants are chiefly Hindoo, but there are some of the original inhabitants who retreated before the Hindoo conquerors into the upland fastnesses, and have preserved their own religion, which has in its turn greatly modified that of their immediate Hindoo neighbours, who have adopted some of their beliefs and practices. The Great Indian Peninsular Railway and the East Indian Railway intersect the country, and a new line has been constructed to

Centrifugal forces cause the dynamics. A moving ion in the same static electric field will have a different motion in a

A schematic diagram of a cyclotron. It shows a cross-section of the dees, which is a semi-circular hollow electrode. A particle, represented by a small circle with a dot, is shown moving in a spiral path within the dees. The path starts at the center and spirals outwards. The particle is shown at two points on its path, labeled 'A' and 'B'. The dees is labeled 'D' at the top. The particle's path is labeled 'B' at two points. The particle is shown moving from 'A' to 'B' and then back to 'A'.

CENTRIFUGAL PUMP.

Centumviri, a civil court at Rome, the functions of which, however, are extremely obscure. According to one authority, it was composed of three jurors from each of the 35 tribes.

Centurion, in the Roman army, originally the commander of a *centuria*, or company of foot-soldiers, nominally of 100 men. In the second Punic war, however, there were two such companies to the *manipulus*, or body of 120 men, and there were afterwards always 60 centuries and centurions to the legion. The centurions were chosen by the commanders of the legion. They seem to have varied considerably in rank, and the senior centurion of the legion (*centurio primi pili*) was an important personage, and admitted to the field officers' council of war. Each centurion had a lieutenant (*optio*) under him selected by himself. They seem to have been rarely promoted to higher posts, and usually rose from the ranks. As charged with the discipline of their company, their badge of office was a vine-staff, with which they inflicted floggings.

Ceos, now ZEA or TZIA, an island of the Ægean, lying 14 miles from the coast of Attica, and forming one of the group of the Cyclades. It is about 13 miles long and 8 broad, and rises gradually toward the central point, Mount Elias, 1,860 ft. in height. The chief products of the island are citrons, lemons, olives, wine, and honey. Of the four towns which the island anciently possessed the only one now of importance is Zea, the capital, whose population forms more than half of the whole population of the islands. The Cean laws were of old proverbial for their excellence.

Cephaëlis. [IPECACUANHA.]

Cephalaspis, a genus of fossil fishes occurring, among the earliest of the class, in Upper Silurian and Old Red Sandstone deposits. It is the type of the family *Cephalaspidæ* of the sub-order *Placodermata* of the ganoids. It has a persistent notochord, but ossified peripheral elements of the vertebræ, a heterocercal tail, a dorsal fin, rhomboid scales, and a head-shield with distinct bone-cells. It is named from its cephalic shield, with its posterior angles produced into long "cornua."

Cephalobranchiata, the group of worms in which the branchiæ or gills are borne on or around the head; they are usually fixed forms, living in tubes made of calcareous matter, or of particles of sand, mud, shells, etc., cemented together.

Cephalonia, anciently SAME and CEPHALLENIA, one of the Ionian islands, opposite the Gulf of Corinth. It is 30 miles long, and of a breadth varying from 20 miles in the south to about 3 in the part which lies parallel to Ithaca, from which it is separated by a strait of 4 miles across. The island is mountainous, and Monte Negro—so called from the pine forests which clothe it—has a height of 5,300 feet. The productions are currants and olive oil. The grape-vine has of late been largely cultivated, and there is a growing wine trade. Some cotton is also produced upon the low-lying grounds.

Cephalophora (*i.e.* head-bearing), the subdivision of the phylum Mollusca that includes all those classes which have heads, viz. the CEPHALOPODA, PTEROPODA, GASTROPODA, and

SCAPHOPODA. It is used in contradistinction to the AOEPHALA.

Cephalopoda (or *head-footed*), a class of Mollusca in which the foot is produced into three pairs of lobes; one pair of these meet in front of the mouth, and thus the head appears to be surrounded by the feet. The main characters of the class which distinguish it from other head-bearing Mollusca are these:—The body is bilaterally symmetrical; the lobes of the feet bear either tentacles or suckers, many in number; there is a powerful muscular fold on the ventral side of the visceral sac, which serves both for respiration and locomotion; the possession of an elongated visceral mass; a highly developed blood-vascular system, with a pair of auricles and branchial hearts; and a series of pigment spots in the skin, which the animal is able to contract or expand, and so change its colour into a resemblance to that of surrounding medium. Of these points the most important are those relating to the development of the foot, which is composed of three regions, each formed by the union of a pair of lateral lobes. The three regions are the propodium, mesopodium, and metapodium. Of these the first is the anterior; it is formed by the two lobes growing round in front of the head; the margin of the propodium is continued out into a series of eight or ten arms provided with suckers (Octopus, Squid, etc.), or of the same number of lobes bearing numerous tentacles (Nautilus). The mesopodium is a flat fold of muscle on the ventral side; it forms a chamber opening to the exterior by a pair of flaps (Nautilus), which have fused into a funnel in the Cuttle Fish, Squid, etc. The hind foot, or metapodium, forms a small valve by which the siphon may be closed. The use of the chamber is partly respiratory and partly locomotor. The chamber may be filled with water, which, on the contraction of the muscular fold, is driven out of the narrow aperture and thus the animal is propelled backwards.

The shell of the Cephalopoda is very characteristic, and very variable in form and importance. In the two orders of the Nautilus and its allies (NAUTILOIDEA) and the Ammonites and their allies (AMMONOIDEA), the shell was external; it was a hollow cone, straight, curved or coiled, divided into a series of chambers by transverse septa; the whole of the chambers were connected by a membranous tube (siphuncle), which was on the outer curve of the shell in the Ammonites, but central or internal in the Nautili. In the Ammonioidea the margins of the septa (suture lines) are usually very sinuous, while in the Nautilioidea they are simply curved. The structure of the young shell is, moreover, very different in these two orders; in the Ammonioidea the embryonic shell (protoconch) is preserved; in the Nautilioidea it is lost, and its place is marked by a scar. In the third order the shell has become enclosed by the mantle; it is coiled and chambered as in *Spirula*, or conical and chambered as in *Belemnites* and *Sepia*. A chitinous sheath, deposited by the enveloping mantle, forms the "guard" of *Belemnites*, the "mucro" and

shagreen layer of *Sepia*. In some forms, e.g. the Squid, this sheath is all that remains of the shell, and is called the "gladius" or "pen." In Octopods even this also is lost.

The respiratory organs consist of one or two pairs of gills or ctenidia, placed in the branchial chamber; they are aerated by water taken into this chamber and forced out through the siphon. The excretory organs (nephridia) lie at the base of the gills, and are, like them, in one or two pairs. Among special organs in the Cephalopoda may be mentioned the ink sac of the order with enclosed shell. This is a bag close to the stomach, with a duct passing out by the anus to the funnel. The sac is filled with sepia, some of which is discharged when the animal wishes to conceal itself. As the shell of the "Squid" consists of a long narrow quill-like plate, the animal has consequently acquired the name of the "pen-and-ink fish."

The Cephalopoda were formerly classified as Tetrabranchiata and Dibranchiata. The former included the more primitive forms with four gills, four nephridia, a primitive "penhole" eye, an external chambered shell, traversed by a membranous tube, the "siphuncle"; they were represented by only one living genus, *Nautilus*. Modern writers separate the forms with external shell into the two orders *Nautiloidea* and *Ammonoidea*. As to the internal organs of the latter order very little is known. The third order with enclosed shell practically corresponds to the old group Dibranchiata. The members of this order have but two gills and nephridia, large and specialised eyes, a funnel, ink-bag, and arms bearing suckers. They are divided into the sub-orders (i) DECAPODA, with ten arms and pedunculate suckers, as in the Squid; (ii) OCTOPODA, with eight arms and sessile suckers, as the Argonaut and Devil-fish.

The oldest Cephalopod came from the Tremadoc rocks in the Cambrian.

Cephaloptera.

Cephalotrocha,

larvæ. It has a single pair of antennæ at the anterior end of the body, and the whole is covered with cilia as "Monotrocha."

Cephalotus, the native of King George's Sound, has many radical leaves, many pitchers, much like those of *Sarracenia*, and doubtless serving an analogous purpose. The flowers are on a long peduncle, and have no corolla, twelve stamens, and a single one-seeded ovary. It is now a distinct genus, now called *Saxifraga*.

Cepola.

Ceran.

Moluccas, the southern part of the island of Amboyna, the leaves are large, and the parts, and the rising to a height of 100 feet. It is known as the "palm" is the

attention; but there are also cocoa plantations; iron-wood, and other timber is exported; and maize, sugar-cane, and a variety of fruits are to be found. Among the birds are the swallows that build edible nests.

Ceramics. [POTTERY.]

Cerastes, a genus or sub-genus of the viper family, confined to Africa, and distinguished chiefly by the development of the scales above the eyes into horn-like processes, whence the popular name, horned vipers. Their scientific designation is the ancient Greek name for a species found in the northern parts of the continent. These reptiles are very venomous.

Cerate, a mixture of waxy and oily substances, in proportions which give a mass of buttery consistency. Ordinary cerate is made by melting together wax, olive oil, and spermaceti. A mixture of resin cerate and vaseline is useful in chemical manipulations as a lubricant for glass stoppers, etc.

Ceratodus, a genus of Dipnoi, with two species, from the fresh waters of Queensland. [MUD-FISH.] The name was originally given to a genus of fish founded on fossil teeth, of Triassic and Jurassic age from Europe, India, and America—their chief British locality being Aust, near Bristol. The living genus, discovered in 1870, received the same name owing to similarity of dentition.

Ceratonia. [CAROB.]

Cerberus, in Greek mythology, the three-headed dog who guarded the entrance of Hell, not so much to keep people from going in as to keep them from getting out when once they got there. His duty was not always successfully performed, since Orpheus charmed him by his music, and Hercules dragged him neck and crop to the upper world. Hesiod represents Cerberus as having many heads, but three is the more orthodox number. Some derive the name from Erebus, or darkness.

Cercaria. [LIVER FLUKES.]

Cercis. [JUDAS-TREE.]

Cercopithecus, a genus of monkeys, with about twenty species, from tropical Africa. They belong to the Cynomorpha, or dog-shaped monkeys, but are graceful and amusing, and the fur of many of them is finely marked.

Cercopoda are the short style-like processes of which there are a pair at the hinder end of some insects, such as cockroaches, grasshoppers, etc. They are regarded as the rudiments of a pair of limbs, and are thus of interest, as they are the only legs in insects which are not on the thorax or middle division of the body. They apparently suggest that the ancestral form of the insects had a pair of legs to each segment of the body.

Cere. [BILL.]

Cereals, grains used for food mostly as bread-stuffs, or ground into flour or meal. They are mostly grasses, the chief being wheat, barley, oats, rye, and the millets. With them may be classed buckwheat, which is not a grass, and maize and

rice, which are largely eaten in an unground condition. The cereal grains, so called from the Roman goddess Ceres, form the staple food of more than four-fifths of the human race. [GRASSES, WHEAT, BARLEY, etc.]

Cerebration, UNCONSCIOUS. This term has been applied to cases of the following kind:—A person, after making unavailing attempts to remember something, puts the question aside, and then suddenly, when he is occupied with an entirely different class of thoughts, the fact he has been striving to recollect flashes across his mind. To call such a phenomenon unconscious cerebration implies a belief in a theory, viz. that the elaboration of reasoning processes in the brain can go on unconsciously. This may be the case, but most instances of so-called unconscious cerebration admit of other and simpler explanations.

Cerebrin, a tasteless and odourless white powder, which can be extracted from brain substance, and which also enters into the composition of nerves, pus-corpuscles, and yolk of egg.

Cerebro-spinal Fluid. This fluid is contained in the ventricles of the brain and in the central canal of the spinal cord; it is also found forming a kind of water cushion which envelops the delicate nervous structures, and occupying the subarachnoid and subdural cavities. The importance of the layer of fluid in protecting the brain and cord from injury, and the manner in which the amount of fluid is adapted to the capacity of the cranial cavity [BRAIN] have been already alluded to. Cerebro-spinal fluid contains but little solid matter. Its specific gravity rarely exceeds 1010; a little proteid is present in it, and there is usually a trace of a substance which reduces copper salts. Cerebro-spinal fluid sometimes escapes from the ear in cases of fracture of the base of the skull.

Cereopsis, a genus of geese, with a single species (*C. novæ-hollandiæ*), from Australia and the adjacent islands, owing generic distinction chiefly to the broad cere which nearly covers the bill. The flight is laboured, and the flesh is excellent in flavour—two important factors in the increasing rarity of these birds. Their nearest ally, the extinct New Zealand goose (*Cnentiornis*) was probably incapable of flight.

Ceres, the Roman goddess of seedtime and harvest, afterwards amalgamated with the Greek goddess Demeter, and credited with all the virtues and properties of the latter goddess. The story of Demeter's loss of her daughter, who was abducted by Pluto as she was picking flowers in the meadows of Enna in Sicily, and how the sorrowing mother sought Persephone over the earth till Zeus in pity allowed mother and child to live together on the earth for half the year, has been prettily told by the poets, and the coming back of Persephone to her mother forms the subject of many paintings.

Cereus, a large genus of *Cactaceæ*, having numerous stamens united at the base and nearly as long as the petals, and a slender style but little

longer. Among the best-known species are *C. giganteus*, of the deserts of New Mexico, and *C. grandiflorus*, of the West Indies. The former grows fifty or sixty feet in height, with an erect cylindric fluted stem, unbranched, or with branches turning upwards parallel with the main stem. The spines rise in tufts on cushions along the ribs or flutings. *C. grandiflorus*, and other species with pale flowers, blossom at night, giving off a vanilla-like perfume intermittently.

Cerignola, a town of Italy, in the Neapolitan province of Capitanata, 23 miles S.E. of Foggia, on a height commanding a fertile plain that produces almonds and cotton. Gonsalvo de Cordova's victory over the French at this spot, in 1503, established the Spanish supremacy in Naples. Linen manufactures are carried on.

Cerigo, anciently and now again known as Cythera, the most southerly of the Ionian islands, separated by a strait from the Morea. The island is rocky and broken, but some spots are fertile. The greater part is pasture land, and the goat-cheeses of the island are noted. It produces also good olive oil. There are beautiful stalactite caves in the island, one being near Capsali, which is the capital. Although Cythera was the home of Aphrodite (Venus), no traces of her shrine are to be found.

Cerinthus, an early Christian heretic (98–117). Ireneus, who is the chief authority on his doctrines, states that he maintained that the world was not created by God, but by some separate and distinct power that knew not God. He held also that Christ was of simply human birth, but received the Divine nature at His baptism, when the dove descended, and that this Divine nature quitted Him before the crucifixion, since the Divine nature could not suffer. But not much is really known either of Cerinthus or his views. He appears to have had Judaising tendencies, and is said to have been among those who condemned St. Paul's going to Cornelius. There is a story that St. John fled from a bath in which Cerinthus was lest the walls should fall in.

Cerite, a rare mineral, occurring chiefly in Sweden; it consists chiefly of a hydrated silicate of cerium, and, in smaller quantities, of lanthanum and didymium. These three metals were originally discovered in this mineral.

Cerium (Ce. at. wt. 140, sp. gr. 6.72), a rare malleable and lustrous metal, occurring with others in cerite and a few other minerals. It burns in air with great brilliancy, and forms two oxides, Ce_2O_3 and CeO_2 , and yields series of salts corresponding to both these.

Cerium Oxalate. This drug is contained in the British pharmacopœia. It is administered in cases of vomiting and dyspepsia, and is said to be especially valuable in the vomiting of pregnancy. The dose is 1 to 2 grains.

Certhiidae, a small family of Passerine birds, widely distributed, but absent from the Neotropical and Ethiopian regions. They are climbing or scansorial in habits, having three toes in

Cernuus is a small, slender, black, shining
of the cap. The gills are white, thin, and
rhomboid. The stem is short, thick, and
greyish black. The spores are small, round,
and black. The fungus is found on decaying
wood and is common in the tropics.

Cervantes Saavedra, MIGUEL (1547-1616), a celebrated Spanish soldier, and better known as the author of the immortal *Don Quixote*. He was a native of New Castile, and, like Homer, he was claimed as a native by seven cities. The ancestors of Cervantes came at an early date from Galicia, and appear to have settled at Alcala de Henares, which was the birthplace of Miguel. Not much is known of his youth beyond what may be gathered from his works, but it is clear that he received a fair education, and in 1568 he is mentioned as succeeding in a poetical competition upon the occasion of the funeral of Isabel, wife of Philip II. In the same year we find him at Madrid as the page of Cardinal Acquaviva, whom he accompanied to Rome. In 1570 he entered the army at an epoch when the Spanish arms were at the height of their renown, and his first campaign was at sea. At the battle of Lepanto he got out of a sick bed in spite of remonstrance, and so bore himself as to attract the notice of the commander-in-chief, Don John of Austria. In 1573 Cervantes took part in the expedition of Don John against Tunis, and in 1575, while returning upon leave from the army in Italy, he was captured by Algerine pirates. He remained in slavery for five years, and has recorded his experiences in *Don Quixote*. He again joined the army, but his services were forgotten, and in 1583 he quitted the army and returned to literature. One work of this period was a prose pastoral, *Galatea*, which he criticises in *Don Quixote*, and which appears to be neither better nor worse than the ordinary stilted poetry of the period. In 1584 Cervantes married, and continued to write poetry and dramatic pieces which seem to have had much success. But he could not compete with Lope de Vega as a dramatist, and the next twenty years of his life were passed in a struggle with poverty which almost precluded him from writing. In 1588 he was employed in the victualling of the Invincible Armada; in 1598 he wrote a sonnet ridiculing the extravagant pomp which marked the funeral of Philip II., and in 1603 he was among the crowd of those who vainly expected something from the new Court. It was in 1605 that he published the first part of *Don Quixote*, which, in spite of its literary defects and marks of carelessness, had a great success. Those who missed its points as a satire aimed at the extravagant romances of chivalry which marked the decadence of chivalry itself, enjoyed the work as an entertaining book, and the many editions were a proof of its popularity. Between the first and second parts of *Don Quixote* a period of great literary activity intervenes. He published among other works some stories which were full of incident, and are said to have inspired Sir Walter Scott with the idea of writing the *Waverley Novels*. Before the second part of *Don Quixote* appeared, a spurious second part was

issued, as to whose authorship there is some controversy, but the general opinion is that it was the work of one Aliaga, the confessor of the Duke of Lerma, and Lope de Vega is not without suspicion of having been concerned in the attempt to bring a brother dramatist into contempt. In 1615 Cervantes's own second part appeared, and quickly demolished the reputation of the spurious one. The fame of the work spread through many lands, since, like Shakspeare, Cervantes wrote for all time, and foreigners who visited Madrid made it their first business to inquire after the author of *Don Quixote*. He died in the same year and almost on the same day as Shakspeare; and his country, that cared little for him during life, cannot now say what became of his bones. But the principle that the blood of the martyrs is the seed of the church is as true of literature as of other religions, and Cervantes's country extends far beyond Spain. There are few to whom *Don Quixote* is not dear, or who have not enjoyed the mingled shrewdness and simplicity of Sancho. Had Sancho not existed we should never have seen a Planchet or an Andrew Fairservice.

Cervidae. [DEER.]

Cesarevitch (son of *Cesar*), the eldest son and heir of the Czar of Russia. Originally the title was applied to any of the sons, and it was introduced as a title for his second son by the Czar Paul at the end of the 18th century.

Cesarotti Melchior (1730-1808), an Italian poet, who, born at Padua, became professor of rhetoric at the university there, and at the age of 38 professor of Greek and Hebrew. For his services in the French cause he was pensioned and made a Knight of the Iron Cross by Napoleon I. He is chiefly known as the translator of *Homer* and *Ossian*. Among his other works are a *Course of Greek Literature*, an essay on the *Philosophy of Language*, and one on the *Philosophy of Taste*.

Cesena, a cathedral town of Central Italy, 12 miles S.E. of Forlì, has a trade in silk, hemp, wine, and sulphur, and produces good brick earth. Two Popes—Pius VI. and Pius VII.—were born here, and there is a celebrated shrine of Madonna del Monte. This town was one of the first to revolt from the Papal authority in 1859.

Cessio Bonorum (in Roman law) signified a debtor's surrender of his property to his creditors. It did not operate as a discharge of his debts unless the property surrendered was adequate to their discharge, if otherwise after acquired property was available for their liquidation, so that the debtor was not left in want. Therefore *Cessio bonorum* operated as a discharge *pro tanto* only. In Holland, according to Huberus, it did not even exempt the debtor from imprisonment, unless the creditors acquiesced, and the same law prevails in many parts of Germany. In Scotland the law on this subject is similar to that of the Roman Code in its principal features.* The modern code of France

* By an important statute passed in 1881 the debtor under a *cessio* may obtain a statutory discharge in case of his paying 5s. in the £ to his creditors, or satisfying the sheriff that it is not his fault such a dividend has not been forthcoming.

adopts the same system. *Cessio bonorum* amounts to an act of bankruptcy in England.

Cestodea, one of the classes of flat worms or PLATYELMINTHES. They are unisegmental, or else appear to be falsely segmental, as the body is composed of many joints known as "proglottides." They are all parasitic, and therefore are degraded: they have no organs of special sense, or definite digestive tract. The body or "strobila," as the full sexual form is called, consists of three main parts: the head or prosclex, the neck and the joints or proglottides. The former contains the hooks or suckers by which the worm attaches itself to the wall of the intestine of its host (the animal in which it is parasitic). The head may have four suckers and a circle of hooks, as in the common *Taenia* or tapeworm; or may have four suckers and four processes, or "proboscide" armed with hooks; or it may be provided only with a pair of sucking grooves. The head and neck form the scolex. The neck is short, and normally gives origin to a series of "proglottides," or joints which are shed when mature. Each joint contains a complete set of generative organs and excretory vessels, also a pair of lateral nerve cords, which run down the whole length of the body from the single anterior nerve ganglion. But in some cases the proglottides are not well defined, as in the genus *Bothriocephalus*, which infests the dog and horse, etc.; while they are not developed at all in the family *Caryophyllæidæ*, which inhabit certain fish (Cyprinoids). The Cestodea are hermaphrodite, each ripe joint containing a set of both male and female organs: these are somewhat complex. [TAPEWORM.] The most striking feature in this class is the life history. The eggs are swallowed by some animal, generally one that feeds on vegetable material; when in the stomach of this, the gastric fluid dissolves the strong leathery coat in which the eggs are protected, and the embryo absorbs the digestive juices. The head is then developed, and by its hard jaws burrows its way through the walls of the stomach or intestine, and settles in the tissues of the host; it there becomes "encysted," i.e. it enters upon its resting stage, inclosed in a thick case. In this condition it remains till its host is eaten by some carnivorous animal. The cyst having been ruptured or dissolved, the larval worm continues its development. The scolex, composed of the head and neck, is first formed, and by the suckers or hooks on the head attaches itself to the wall of the intestine: it absorbs the food material prepared by the host, and soon develops the joints or proglottides. These increase in size from before backward; new ones are formed immediately behind the head: the oldest and largest ones are shed when mature.

The origin of the Cestodea is a somewhat obscure problem. It has been thought that the proglottides are a case of serial gemmation comparable to that of some Tunicates, etc., [SALPA], and that the whole life history is but a case of Alternation of Generations (q.v.). This view involves the idea that the proglottides are to be considered to some extent as individuals. That, however, can hardly be the case, on account of the

continuity of the various body-systems, notably the nervous system, from the head right through the proglottides. It seems more probable that the scolex and proscœx are both to be regarded as non-sexual forms, which only become sexual under the more favourable conditions of food supply, etc., offered by the second host. The scolex and proscœx in fact may be only organs of adhesion, a view urged by Moniez. The latter view, which does not apply the phenomenon of alternation of generations, gains support by the facts that in one case (*Ligula*) the joints are developed in the first host, while in another (*Archigetes*) the whole life history is completed in the one host—the small red river worm *Tubifex*; this latter case is of interest, moreover, as the only Cestoid parasitic on an invertebrate. There are six families included in the Cestoidea.

Cestracion, a genus of sharks, the type of a family which has existed from Devonian times, and has numerous fossil genera in later formations, all far exceeding the single living genus in size. The dentition of the whole family is adapted for seizing and crushing the crustaceans and molluscs which formed their food, and the living species are similarly provided with blunt pad-like teeth. In *Cestracion* there is no nictitating membrane; two dorsal fins are present, each with a spine in front. The spiracles, just under the eye, are small, and the gill-slits narrow. Four species, none over five feet long, are known; from Japan, Amboyna, Australia, California, and the Galapagos. The best known is probably *C. philippi*, the Port Jackson shark. The egg is deposited in a pear-shaped leathery case, round which are two broad ridges or plates.

Cestus, (1) the thongs wound round their hands and arms by Greek and Roman boxers, to give greater strength and force to their blows. Under the Roman Empire were most formidable weapons, loaded with lead and iron nails. There were several sizes, from the heaviest was (2) A kind of girdle worn by the Romans (in mythology) the fabled *Cestus* of Hercules, adorned with amorous charms.

Cetacea, an order of mammals, widely distributed in all seas, in, and others that from rivers. The order dates from the fossil species occur down to the present. Professor Flower thinks that the Cetacea are related to the Urodela, and that the fluvial, and the order "taken" links of animals, or with the land conformation, a powerful expansion into the sea produced the cetacea, and the exact and immediate blubber; the fore limbs

limbs are absent or only indicated internally; the pelvis also is rudimentary. The nostrils, blowholes, or spiracles are generally on the top of the head, and the so-called "blowing" is only the ordinary breathing of these animals, which do not expel from these blowholes water taken in at the mouth. In size the Cetacea differ greatly—from four feet to sixty feet or more in length. They are generally inoffensive, and for the most part feed on small molluscs and crustacea, the grampus (q.v.) alone preying on warm-blooded animals, e.g. small dolphins or porpoises.

Ceterach, a genus of ferns, of which one species, *C. officinarum*, once supposed to be efficacious in diseases of the spleen, is not uncommon on limestone rocks in England. Having the sori on the under surface of the leaf hidden by thickly massed brown scales, it is known as the scale-fern.

Cetiosaurus, a genus of dinosaurian reptiles (q.v.), occurring in Jurassic and Lower Cretaceous rocks. It is referred by O. C. Marsh to the family *Morosauridae*, of the order *Sauropode*, being herbivorous, and having its fore and hind limbs nearly equal, with solid limb-bones, five digits to each limb, and plantigrade feet furnished with claws. Its teeth were truncate and slightly serrate, like those of *Iguanodon* (q.v.). It seems to have been a marsh-loving or river-side animal, feeding upon the ferns, cycads or conifers, among which it lived, and reaching a height of not less than fifteen or twenty feet at the shoulder, with a length of sixty or seventy feet.

Cette, a French sea-port, in the department of Hérault, and about 20 miles S.W. of Montpellier, occupies the slope and the foot of a hill on a tongue of land that lies between the Mediterranean and the Lagoon of Thau. The harbour, protected by a mole and breakwater, is safe in all weathers, and will accommodate 400 vessels. Canals connect the port with the Rhone, and it has large inland as well as foreign trade. The chief exports are wine, brandy, salt, dried fruits, and fish, verdigris, and corks. There are many factories, and much sardine, cod, and oyster fishing is carried on.

Ceuta, a Spanish fortified fort on the coast of Morocco, opposite Gibraltar. Among the seven hills which gave its name to a Roman colony, which was once planted here, is Abyla (Hacho), one of the pillars of Hercules, now occupied by a fort, while upon a companion hill—Monte Almina—is the new town. The town, which is chiefly important as a military and convict station, has a cathedral and a bishop, who is the suffragan of Seville. There is a small harbour, and some trade. Under the Arab government Ceuta is said to have had the first paper factory of Western Europe. It was taken by Portugal in 1415, and became Spanish in 1580.

Cevadilla. [SABADILLA.]

Cevennes, a mountain range in Southern France, dividing the valley of the Rhone from those of the Loire and Garonne. Starting from the

Lyonnais mountains in the north, they run south-west, and extend to the Canal du Midi, which divides them from the Pyrenees. They are divided into several parts under different names, and have a length of about 150 miles, with an average height of 3,000 to 4,000 ft. In the Central Cevennes or Cevennes proper, Mount Lozère has a height of 5,000 ft., and to the north Mount Mezenc in Ardèche is 5,780 ft. The Loire, Allier, Lot, and Tarn take their rise in these mountains, which are rich in minerals, well cultivated on the upper slopes, while the upper slopes afford good pasturage, and the tops are clothed with chestnut and pine forests.

Ceylon, called by the Greeks and Romans Taprobane, in the *Arabian Nights* Serendib, known as the Pearl of the Eastern Seas, is an island lying to the S.E. of India, and is almost connected with the mainland by the line of coral reefs and sand-banks known as Adam's Bridge, and extending for 62 miles. The nearest point, however, to the mainland is about 40 miles from Cape Casimir on the 'Coromandel' coast. The island is separated from the mainland by Palk Strait and the Gulf of Manar, and is pear-shaped, the point being towards the north. It lies between lat. 5° 55' and 9° 51' N. and long. 79° 41' and 81° 54' E., having an extreme length of 270 miles, and a breadth of 146 miles, with an area of 24,000 square miles. The north is occupied by plains which rise gradually to the central highlands, and consist of ridges alternating with upland valleys, the highest point being the Pedrotallagalla Peak (8,260 ft.), overlooking a plateau which is 6,000 ft. above sea-level. Other heights are Tolapella (7,720 ft.), Kirrigalpota (7,810 ft.), and Adam's Peak (7,420 ft.). This mountain system forms a complete watershed, from which flow a number of rivers, Ceylon being a very well-watered country. Of these rivers the most important is the Mahavila-Ganga, which rises in the plateau above-mentioned, and flows northward, falling into the sea on the east coast, near Trincomalee. On the west coast are the Kalani-Ganga, the Kala-Ganga, and the Maya Oya. The soil throughout the island is very fertile, and the vegetation varied and luxuriant. The wealth of the island consists chiefly in its plantations of cinnamon, coffee, and cocoanut, while in the lowlands of the north tobacco is grown, and of late tea has begun to be largely cultivated. The cinnamon groves are in the south-west in the neighbourhood of the capital, Colombo, while the coffee plantations occupy the mountain slopes and valleys. There is much valuable timber, especially satin-wood, ebony, and calamander; and there are tree ferns, palms, rhododendrons, and many varieties of orchid; while the animal world embraces the elephant, bear, leopard, wild boar, deer, buffalo, humped ox, civet, monkey, crocodile, tortoise, lizard, cobra di capello, boa and some other species of serpent; and the birds are of countless varieties, from the eagle to the swallow, the lakes and lagoons abounding in flamingoes. The insects are numerous and interesting, especially the leaf and stick insects. Minerals are in great abundance, the chief among them being iron, plumbago, manganese, nitre, alum, and salt, and precious

stones are plentiful—rubies, amethysts, garnets, sapphires, and the catseye. The pearl-fishing is intermittent but important, being a Government monopoly, and under the supervision of an inspector who reports when the time is ripe for fishing.

The climate of Ceylon and the seasons resemble those of the Indian coast so far as the time and nature of the monsoons are concerned, but the temperature is greatly modified and equalised by the fact of Ceylon being an island; the average for the year at Colombo being 80°, while the great table-land, now used as a sanatorium, has an average of 62°, and seldom or never rises above 70° in the shade. Of the harbours, the best is that of Trincomalee, on the east coast. But from the remoteness of Trincomalee from the chief districts, vessels generally use the roadstead of Colombo, which is protected by a breakwater, and affords a safe anchorage, or the harbour of Galle, which is a port of call for the principal lines of steamers running eastward and westward.

In 1900 there were over 5,000 Boer prisoners living on the island; they were taken by the British in the war against the S. African Republics which broke out in 1899 and transported to Ceylon; at the conclusion of the war (1902) they were allowed to return on taking the oath of allegiance.

Ceylon forms a colony altogether distinct from India, and is administered by a Governor appointed by the Crown, and aided by an executive council of five and a legislative council of seventeen. Agents are over the nine provinces into which the island is divided, and the Supreme, Civil, and Criminal Court is in the capital Colombo, which is united by a railway to the ancient inland capital Candy. The natives of Ceylon consist (1) of Singhalese, who are considered the descendants of Aryan colonists, who arrived in the island in 543 B.C., and whose feminine-looking dress, and mode of wearing long hair turned back and fastened with a comb, give them almost the appearance of women; (2) the Kandyans, a sturdy and independent race of Highlanders; (3) the Tamils, who are descended from invaders of South Hindustan, and excel in physique both Singhalese and Kandyans; (4) the Moormen, who are thought to be Arab; and (5) the Veddahs, a wild and debased race in the eastern parts of the island, who are thought to be aboriginal. There are also descendants of the former Portuguese and Dutch owners of Ceylon, who have been naturalised, and are called burghers.

The principal religion of the island is Buddhism (q.v.), mixed with some Brahmanism, and worship of Hindu deities. Three times Buddha visited Ceylon; his footstep upon Adam's Peak is revered, and his sacred tooth is enshrined at Kandy. The Tamils are Brahman or Hindu in religion, and the Moormen Mohammedan.

The ancient ruins and traces of civilisation under the Singhalese kings are numerous and extensive, the remains of large cities having been found in the forests, and there are remains of magnificent tanks in various parts of the island.

The first visit of the Portuguese to Ceylon was in 1505, and in 1517 they formed a trading settlement at Colombo. In 1658 they were driven out by

the Dutch, and in 1796 the Dutch possessions were ceded to England, and formally annexed to the Crown. The King of Kandy was deposed in 1815, and his territories annexed by the British.

Ceyx. [KINGFISHER.]

Châb, a large division of the Arab Bedouins, who migrated many centuries ago from Nejd to the region about the Euphrates and Tigris confluence, but who are now settled chiefly in South Khuzistan, Persia. All have become Shiah, and many have intermarried with the Persians and adopted the Persian language. Eight branches: Ali Bû Nasr, Idris, Bawî (not originally Châbs), Nasara, Mohaisen, Beni Jemim, Haideri Hiyader. The Châb Sheikh is very friendly to the English, and commands great influence in the valley of the Karûn river, which has recently been opened to British trade.

Chabas, FRANÇOIS (1817-1882), a French Egyptologist, who, born at Briançon, was first engaged in commerce, but giving much of his time to study, became a great linguist, and in 1851 gave himself up to the deciphering of hieroglyphics. In 1856 he issued his first publication, and in a valuable series of works did much towards elucidating two important periods of Egyptian history—the conquest of the country by the Hyksos, and their expulsion. For four years he was editor of *L'Égyptologie*.

Chablis, a French town in the Yonne department, head of canton and arrondissement, on the Serein, and in the centre of a rich vine-growing district. It has a world-wide renown for its wine, which is easily king of white wines, and of which many more thousands of gallons are drunk than the district could possibly produce.

Chacma (*Cynoc. porcarus*), the Pig-tailed Baboon, one of the most common of the genus. It is a native of the Cape of Good Hope, the fur is uniform dark-brown, the face, ears, and hands, and there is a pale ring around the eyes. They are noted for their skill in discovering hidden treasures.

Chaconne, an old French dance, of Spanish origin; the term is also applied to a musical composition, usually in 3/4 time, consisting of a series of variations on a single theme. Chaconne is a well-known example.

Chacriaba, a warlike tribe, formerly dominant in the frontier of the British Empire, and a constant feud with the British. They were also harassed by the British. But after the British Government took possession of the district of Chacriaba, they were subdued.

Chad, a large lake in the north-west of Africa, formerly called Lake Tana. It was discovered by the British in 1822, and its waters were found to be very pure.

this appointment three years afterwards, he became bishop of Mercia, and chose Lichfield as the seat of his diocese, finally dying in 672.

Chadwick, EDWIN, a social reformer, was born at Manchester in 1801, and called to the bar in 1830. An article on Life Assurance attracted the attention of Jeremy Bentham, and the Government appointed him assistant commissioner to inquire into the operations of the poor-laws. Much of the present working of them is founded upon his report. He was appointed secretary to the Poor-law Board, and was also connected with the Board of Health. In 1843 he was instrumental in bringing about the change of law with reference to burials in towns, and he was on a commission relative to the employment of children in factories, and on education. He retired with a pension from the Board of Health in 1854, and died in 1891.

Chæroneæ, a town of Boeotia (ancient Greece) near the Cephissus, the birthplace of Plutarch, and remarkable as the spot where Philip of Macedon defeated the Athenians and Boeotians in 338 B.C., and put an end to Greek liberty. Here, too, Sulla, in 86 B.C., defeated the generals of Mithridates. A marble lion in four pieces, dug up in 1880, together with many bones, is thought to be a relic of the former of the above-mentioned battles.

Chætifera, one of the two divisions of the GEPHYREA class of Worms. This order seems the more primitive of the two, and if so it strongly supports the view of the Annelidan origin of this class. The Chætifera are, at least in early stages, composed of several segments; they have a long proboscis (or "prostomium") which is protrusible at the anterior end of the body; the mouth opens at the junction of this with the body. There is one pair of setæ which may represent the last of a series which have been lost. The anus is terminal, and the hindmost pair of excretory organs or "nephridia" open into the rectum close by the anus. There are several pairs of anterior nephridia. Thus the segmentation of the ancestral form is indicated by three points: the external segmentation, the pair of setæ, and the pairs of nephridia. In some cases the embryo is small, and resembles a minute Planarian (q.v.).

Chætoderma is a genus of GASTROPODA, remarkable for being either very primitive or degraded. It belongs to the group of ISOPLEURA, of which *Chiton* is the best known form. It differs from that genus in four main points: the shell is represented only by a few spines or spicules; the mantle is reduced to a mere collar round the anus; the radula or complex armed tongue of other Gastropods is but a single tooth; the "ctenidia" or gills are represented by only one pair instead of a considerable number. These features are suggestive of degradation rather than of primitive structure.

Chætodon, the type-genus of Squamipinnæ (formerly, and sometimes still, called Chætodontidæ), a family of Acanthopterygian fishes with numerous genera from tropical and sub-tropical seas. The species are for the most part brightly coloured and curiously marked, and are generally

found near coral-reefs, whence they are often called "coral-fishes." The body is greatly compressed and elevated, and the jaws are produced into a more or less elongated snout, in the front of which is the mouth; teeth small and slender, and arranged in bands. The anal and dorsal fins are so covered with scales as to obliterate the distinction between them and the body. The type-genus contains about 70 species from the tropical parts of the Atlantic and the coral-reefs of the Indo-Pacific. [ARCHER-FISH.]

Chætognatha, a class of small marine worms: they are all free swimming, and live as a rule on the surface of the sea far from land. A few species occur, however, in the seas around the British islands, and one (*Spadella cephaloptera*) is actually a shore-dweller, and fastens its eggs to algæ. The class includes but two genera, *Sagitta* and *Spadella*. The main features in their anatomy are these: The body is divided by two septa into three regions. The mouth is a small slit on the ventral surface of the body: it is guarded by folds armed with spines and by series of hairs (setæ) on the jaws. There are one or two lateral fins, and one on the tail. The anus is ventral, and opens at the junction of the body and tail. The nervous system consists of two ganglia, one anterior above the digestive tract, and one below it near the centre of the body. These are connected by series of nerves. There are two eyes. The *Sagittæ* are hermaphrodite. The group is one of much interest, as it is small, and occupies a very isolated position in the great phylum of the Worms.

Chætopoda is a great group of Round Worms, which includes those which bear setæ. They are composed of many similar segments, with a head or "prostomium." The nervous system consists of a pair of cerebral ganglia, and a paired cord typically running along the middle of the under side. The excretory organs or nephridia are repeated in a series of pairs, usually one in each segment of the body; but the number may be limited as to six in the "lob worm" (*Arenicola piscatorum*), or there may be many in each somite as in *Acanthodrilus multiporus*. The generative organs may or may not be repeated: the worms are either hermaphrodite, as the "Earthworm" and most OLIGOCHÆTA, or there may be two separate sexes as in most POLYCHÆTA. The setæ are the most characteristic structures: they may be very conspicuous, as in many Polychæta, in some of which, as in *Aphrodite*, the "sea mouse," they are woven into an iridescent felt; or they may be small and few, as in the Earthworm, or even absent, as in the genera *Elosoma* and *Anachæta*. In the Polychæta they are borne on two lateral processes known as "parapodia:" these are composed of two lobes, a dorsal, or "notopodium," and a ventral or "neuropodium." Each of these may also bear a series of respiratory tufted branches, or "cirri." In some cases the cirri may be simple, and flattened out into scale-like "elytra" which protect the exposed dorsal surface, as in *Polynoë*; these may, however, retain their respiratory function as well as being protective. In most cases the anus is terminal, but in a

few there are some small postanal somites, as in *Criodrilus*. Many forms are armed with teeth, as in some species of the family *Syllida*. These are perforated by a poison canal. As to mode of life they are either terrestrial, as most Oligochæta, e.g. the earthworm, or aquatic, whether marine as most Polychæta or freshwater as *Tubifex*: some are free-swimming, as the *Errantia*, others live in tubes as *Serpula*, or burrow through mud and sandbanks as *Arenicola*. The only freshwater Polychæta are a few species of *Lumbricones*. A few are parasitic, such as *Oligonathus bonellie* in some Gephyreans. The Chætopoda are divided into four orders, the OLIGOCHÆTA, POLYCHÆTA, ARCHIANELIDA, and ARCHICHÆTOPODA.

Chaffinch (*Fringilla cœlebs*), a very common British finch (q.v.), and probably the species whose call-note, which has been rendered *pink*, *finch*, and *twink*, obtained for it the name, which has been extended to the whole family Fringillidæ. The specific name (= bachelor) was chosen by Linnæus, because in Sweden the hens were said to leave the country in the winter, while the cocks did not; and it seems to be the fact that in the migration from Britain the hens precede the male birds, and that those which do remain are principally males. The chaffinch is common in Europe and North Africa, ranging east to Asia and west to the Azores. The adult male is about 6 in. long, and in its summer dress has the top of the head (where the feathers are slightly erectile) and nape bluish-grey, the back chestnut, the wings dark with two white bars, and the tail nearly black. The plumage of the hen is much less brilliant, and the young males resemble the adult females, but have the colours more blended. The song is clear and trilling. These birds live chiefly on insects, with which they also feed their young, the old birds at that time subsisting on seeds and grain. The nest is a beautiful structure, covered externally with lichen, and usually containing four or five purplish-buff eggs, streaked and spotted with brown.

Chagatai (Jagatai), a cultivated Turki language current in Bokhara, Khiva, and Ferghâna, mixed with Arabic and Persian elements; in this idiom are written the Emperor Baber's *Memoirs* (16th century). The name, which is also applied to the Turki (Tatar) peoples of Eastern Turkistan, is taken from Chagatai, Jenghis Khan's second son, who in the partition of the empire inherited this region, and whose successors held it till the Mongol dynasty was overthrown by Timur Beg. The Chagatai state was later divided into Moghulistan and Mawerannahr (Transoxiana). But most of the Nomad populations of E. Turkistan are of Turki stock; hence the so-called Chagatai tribes and Chagatai speech are Tatar, not Mongolian, although Chagatai himself was a pure Mongolian. Ignorance of this fact has caused immense confusion in most works on the ethnology of the Mongolo-Tatar peoples.

Chagres, a town of the United States of Colombia on the N. coast of the Isthmus of Panama, 12 miles from Colon, and at the mouth of the Chagres river. At the time of the Californian gold fever Chagres

Chain Mail, a kind of armour made of interlaced rings or links (as in the illustration) and

Chain-making is an important mechanical industry. For the past twenty years from 15,000 to 20,000 tons of chain have annually passed inspection, and withstood the regulation tests in England. The manufacture of very small chains affords employment to women and children, but all heavy work requires the skilled labour of men trained to this special smiths' work. The links in a chain are either *unstudded* or *studded*. The former type of link is made of a bar of proper length and thickness, heated to a suitable temperature, and bent into a loop so that the ends meet. These ends are then joined together, and while still soft the link is drawn out to the desired shape, and a finish is given to it. Additional links are threaded through the first one before being welded. This type of chain is used for chains of over 10 ft. length, and is closed at the side and stretched by means of a *stud* welded across its middle. It is broken up into two parts. One part is subjected to a sudden shock; the other is gradually strained brittle. They must be tested under stress, thus the iron end must be able to stand the required strain. The latter part of the chain as compared with the former is much weaker. The application of the test is such that the fathom of the chain is determined by the weakness of the link which will break under the specified load. The test is applied to the chain from any direction, and the result is the stress on the chain.



Chalaza, a Greek word meaning a tubercle, is applied in botany to the structural base of the ovule (q.v.), at which point the vascular bundle of the seed generally terminates, and the integuments (*secundine* and *primine*) spring from the body of the ovule (*nucellus* or *torcine*). In inverted or *anatropous* ovules the chalaza is actually at the

top of the ovule, i.e. at the end farthest from the placenta. In the exceptional type *Cusuarina* the pollen-tube pierces the chalaza, whence Treub has separated this genus from all other angiosperms as a subdivision *Chalazogama*.

Chalcedon, or **CALCHEDON**, a coast town of ancient Bithynia in Asia Minor, almost opposite Byzantium, and south of the present town of Scutari. It was founded by a colony from Megara, and was called the City of the Blind, as being founded by those who could not see the greater advantages of the site upon the opposite coast. It was taken by the Persians, was made a free city under the Roman Empire, was again taken by the Persians in 616 A.D., and was finally demolished by the Turks, who took its ruins as building material for Constantinople. The fourth (Ecumenical) Council was held here in 451 A.D. to settle points disputed by the Monophysites and the Nestorians.

Chalcedony, named from Chalcedon in Asia Minor, is a crypto-crystalline mixture of quartz and opal. It occurs in stalactitic or mammillated forms, in flint-nodules, and in agates, with a radiating acicular crystallisation at right angles to the surface of the bosses. It is rather waxy in lustre, and varies much in colour, *carneian* (q.v.) or *sard* being the red or brownish-red variety; *prase*, leek-green; *plasma*, the same colour, but more translucent; *chrysoprase*, an apple-green; *onyx*, a regularly-banded form, white and bluish-grey; and *ardonyx*, similar, but red and white.

Chalcididae, **CHALCIDÆ**, a family of small lizards, of which the genus *Chalcides* or *Chalcis* is the type. According to Wallace, it contains three genera and eight species, and is characteristic of Central America.

Chalcis, the capital of Eubœa, on the Euripus, a strait or stream 120 ft. wide. The navigable channel of this strait has recently been widened, and it is crossed by a bridge. This ancient city was of much importance for its trade, and also as a great centre of colonisation, as it sent colonies to Italy, Sicily, and Macedonia, where it gave its name to the Peninsula of Chalcidice. In the Middle Ages the Venetians held it, and it was taken by the Turks in 1470. The philosopher Aristotle died here.

Chaldeans (Kaldani), Semitic Christian communities in Mossul, the Kurdistan Mountains, opposite Lake Urumiah, and elsewhere in Persia and Turkey; by some supposed to be descended from the ten lost tribes, by others to represent the old Assyrians; commonly but wrongly called Nestorians, being simply Eastern Christians with a national liturgy. The term Kaldi occurs in Assyrian cuneiform writings at least 900 years before Christ as the national name of the later Babylonians ("Chaldeans"), who were of Semitic stock and speech, closely allied to the Assyrians. The present speech (Chaldee) is a corrupt Aramaic (Syriac) dialect written in a modified form of the stranghelo (Old Syriac) alphabet. Amongst them American Protestant missionaries have long been at work. [NESTORIANS.]

Chaldee. [CHALDEANS.]

Chalfont St. Giles, a village of Buckinghamshire, a few miles from Aylesbury, and noted as the residence of Milton, whose cottage still exists.

Chalice (Lat. *calix*, a cup). The term is applied almost exclusively to the cup in which the consecrated wine is administered at Holy Communion. The chalice was formerly often covered by a plate or paten containing the consecrated elements. Old chalices, particularly those of the 15th and 16th centuries, are often elaborately decorated and ornamented with precious stones. The legality of the "mixed chalice," i.e. of mixing water with the consecrated wine, has been a subject of controversy in the Church of England.

Chalk, an earthy form of limestone, belonging mostly to the upper part of the Cretaceous system (q.v.). It is usually white, but sometimes grey, red, or greenish; is very friable, breaking with an uneven fracture, and has an insipid taste. In addition to carbonate of lime (CaCO_3), chalk usually contains some silica, iron-oxide, and alumina, the Red Chalk of Hunstanton, in Norfolk, containing more than nine per cent. of these impurities. On microscopic examination chalk is found to consist mainly of the shells of *Globigerina* and other Foraminifera (q.v.), thus presenting some analogy to the white ooze now forming in the deep Atlantic. Chalk occurs in thin beds under the Tertiary volcanic rocks of Mull, Morven, and Antrim, where it is baked so as sometimes to have become marble (q.v.). From the western Midlands it has been removed, leaving behind its less destructible flints, and now extends as an escarpment from the borders of Devon and Dorset, through Salisbury Plain, the Hampshire and Berks downs, the Chiltern and Gogmagog hills, and the wolds of Norfolk and Lincoln, to Flamborough Head. A downward fold carries it under the London basin, and parallel upward curves form the North and South Downs, ending in the Forelands and Beachy Head, and the downs of the Isle of Wight. On the Continent it extends to the Crimea and from the south of Sweden to Bordeaux, over about 1,100 miles in one direction, and nearly 900 in the other. It varies in thickness from 600 to 1,000 feet, and its general freedom from sand and pebbles points to its formation in open sea, though masses of granitic rocks, believed to have been carried by ice, have been found in it. Besides the minute foraminifers, the most characteristic fossils of the Chalk are sponges, often in the flint-nodules that occur in lines in the Upper Chalk, sea-urchins in great numbers, brachiopods, such as *Terebratula* (q.v.), scallops, oysters, the bivalve genus *Inoceramus*, ammonites, the teeth of sharks and rays, and the bones of turtles and saurian reptiles. Some of these being confined to certain parts of the formation, it has been divided into zones which are grouped in three main divisions, bearing names of French origin—the *Cenomanian*, impure and marly, including the Grey Chalk of Folkestone and Totternhoe stone; the *Turonian*, or Lower Chalk without flints, surmounted by the Chalk Rock of Dover; and the *Senonian*, or Upper Chalk with flints. Chalk, being very porous, is an important

Challoner, Richard, an English Jesuit, was born in 1691 at Exeter, Devonshire. His father was a dissenting minister, and his mother a Catholic. In 1730 he came to Rome, and in 1741 was raised to the rank of cardinal. He was sent to Hammersmith, Middlesex, in 1742, to be the first English Jesuit in England. At the time of the French Revolution he was obliged to seek refuge in France, and to secretly return to England in 1793. He died in 1808, and was canonized in 1846. He was the author of numerous controversial works, and was a member of the Académie Française. His works were translated into French by Conyers Middleton, and into Italian by Giovanni Maria Gardano. He was a devoted friend of the English Catholic mission, and died in 1808.

Châlons-sur-Marne, a French city, capital of the department of Marne, is situated on the right bank of the Marne river. It is the town of the *Catalauni* of antiquity, and was the scene of the defeat of Attila by the Romans in 451 A.D. Among its buildings are the Gothic cathedral, the Hôtel de Ville, built in 1772, and the Prefecture, built in 1764, and reputed one of the finest buildings

of its class in France. In its beautiful park were some fine elms, which the Germans during the Franco-Prussian war cut down for fuel. In 1856 Napoleon III. formed a camp in the neighbourhood for the training of French troops. It has a trade in champagne, and among its industries are woollens and cottons.

Châlons-sur-Saône, a French town in the department of Saône-et-Loire, is situated on the right bank of the Saône river. Its most notable buildings are the church of St. Vincent, which dates from the fourteenth century, the church of St. Pierre, the exchange and commercial college. Its industries embrace iron-foundries, ship-building, glass, chemicals, and dye works.

Chalybeate Waters are those natural waters which contain iron in the state of protoxide or carbonate, or less frequently as sulphate or crenate. The quantity present is usually from .03 to .12 per 1000 parts of water, and the best chalybeates contain also sodium carbonate, chloride and sulphate, and free carbon-dioxide, to which some of the curative effects are probably due. Some are strongly sulphuric or aluminated, *e.g.* Oak Orchard, New York, which has 10 grains of free sulphuric acid per pint. These are astringent and can only be used diluted. Chalybeate waters are rarely thermal. They are recommended for anæmia, but it is doubtful if the iron has any therapeutic effect. The stronger kinds are useful in scrofula and chronic diarrhoea. They have an inky taste, and often encrust surrounding objects with rust (hydrous iron-oxide).

Cham, French name for Ham, son of Noah, was the pseudonym adopted by Amédée de Noé, who was born in 1819 at Paris, and died there in 1879. He was the son of Comte de Noé, and studied art under Delaroche. In 1843, having become famous for the wit of his pencil, he began to contribute for the *Charivari*, his best hits being on social rather than political subjects. He was a pronounced sceptic. There are several good collections of his comic illustrations, notably *Douze Années Comiques* (1880) with an introductory essay by L. Halévy.

Cham (Tsiam), a historic nation of Indo-China which formerly occupied all the eastern seaboard from about 19° N. latitude to Cape St. James, but were gradually driven southwards, and at last broken into fragments by the Annamese in 1471; now confined to the S.E. corner of the peninsula, and to some districts in Camboja. The Chams have left monuments covered with inscriptions which appear to be written in a language intermediate between Cambojan and Malay. Are supposed by some ethnologists to represent the original stock of the Malay race, which afterwards spread from the Asiatic mainland over the oceanic world. See Bouillevaux, *Le Ciampa*, in *Annales de l'extrême Orient* (1879, 1881); Aymonier, *Excursions*, etc., Saigon, 1890.

Chamæleon, a genus of lizards of the group Vermilingues, with about 30 species, forming a family clearly marked off from all the other members of the order by external characters, as

well as by their anatomical peculiarities. They are almost exclusively Ethiopian, abounding in Africa, while peculiar forms exist in Bourbon, Madagascar, and Fernando Po. The Common Chameleon (*C. vulgaris*) is found in the south of Spain, the north and south of Africa, ranging eastward to India and Ceylon. The body is flattened, and the skin of the back is serrated so as to form a kind of crest. The head is triangular, the eyes are large, circular, covered, except in the middle, with shagreen-like skin, and capable of independent movement in every direction. There is no external ear, and the mouth is a large slit. The tail is prehensile, and used to aid progression, and is generally twisted round a twig as a support. The skin resembles shagreen, and owing to the disposition of the pigment-cells the animals of this family have the power of changing colour in an extraordinary degree. The digits on each limb are divided into sets of two and three, and with these a bough is clasped somewhat after the fashion of a climbing bird. The chameleons possess a long fleshy tongue, with a sort of cup at the end; this organ can be protruded at will, and, when an insect comes within reach, is suddenly shot forth and as suddenly drawn back, the prey being secured by a viscid secretion from the tip. All these animals are arboreal in habits and extremely sluggish, lying in wait for, not hunting, their prey. The majority of them are oviparous, but a small South African species, kept in the ward-room of the *Challenger*, gave birth to three young ones. In one form from Madagascar, often made a distinct genus (*Rhampholeon spectrum*), the tail is too short to be prehensile, but the digits are modified so as to give additional power of grip. The spelling Chameleon is generally used for any individual of the family.

Chamærops, a genus of palms, including about a dozen species, of small size, with fan-shaped leaves. They occur farther north than other genera, *C. humilis*, a native of both shores of the Mediterranean, being the only European palm. Its leaves are made into hats, baskets, brooms, thatch, etc., and their fibre used instead of horse-hair or camels' hair.

Chamba, a state of Northern India, is bounded on the north and west by the Cashmere territory, by a range of mountains separating it from Kashmir, on the east by the British *parganas* of Bangahal and Lahaul in Kangra district, and on the south by mountains separating it from the Kangra Valley. Its area is about 3,200 square miles. Among its rivers are the Ravee and Chenab, whose banks are lined with immense forests leased to the British Government. The chief town bears the same name and is situated on the Ravee.

Chamberlain is one having the management or direction of a chamber or chambers. The most important one is (1) the Lord Chamberlain of Great Britain, the sixth high officer of the Crown, having the government of the Palace at Westminster, and into whose custody are delivered on important occasions the keys of Westminster Hall. He disposes of the sword of state which is carried before the King when he comes to Parliament, and goes

on the right-hand side next to the King's person. He has also to provide all things in the House of Lords during the session, the Gentleman Usher of the Black Rod, Yeoman Usher, etc., being under his control. The office is hereditary. (2) There is also the "Lord Chamberlain of the Household," who has the superintendence of all officers belonging to the King's chambers, except the precincts of the bedchamber. The appointment to this office changes with the government of the day, and to the holder of it appertains the important jurisdiction of licensing theatres in the metropolis and all towns in which a royal palace is situated. (3) There is also the Chamberlain of the City of London, who is an officer elected by the freemen who are liverymen.

Chamberlain, THE RIGHT HON. JOSEPH, was born in 1836 in London. Educated at University College school, he thereafter entered the firm of Nettlefold, Birmingham, screw makers, retiring from business in 1874, the year in which he unsuccessfully opposed Mr. Roebuck at Sheffield. Two years later he was returned to Parliament for Birmingham (in the municipal politics of which town he had long taken a prominent part), and making an early impression, he was appointed President of the Board of Trade by Mr. Gladstone in 1880. He was long the reputed leader of the advanced wing of the Liberal party, and his attacks on the landed interest, together with the "unauthorised programme" of the Liberal party, issued just before the 1885 election, produced a considerable sensation. When Mr. Gladstone returned to office in 1886 he received the Presidency of the Local Government Board, which he resigned on Mr. Gladstone's Home Rule measures becoming known, and followed Lord Hartington into the Liberal Unionist party. In 1895 he became Secretary for the Colonies in Lord Salisbury's Ministry, and played a prominent part in the proceedings which followed Jameson's celebrated raid, and in the negotiations preceding the war with the Transvaal (1899). In 1900 he filled the same post, and his south African policy was the great cause of the General Election of that year. In 1902 he was Secretary of the war, and he was engaged on the negotiations with Africa, and paid a visit to the Cape in 1902, returning in 1903. In that year he was Secretary for the adoption of the new constitution for the colonies, involving the colonies wishing to be free to determine their own future. He resigned his office and returned to the country. He organised the "Up to the Mountains" scheme, a definite scheme for the improvement of the General Election of 1906, and secured an overwhelming majority for the Liberal Unionists, retaining his office until 1908. He was in the same position until 1909, when he was dismissed and he was succeeded by Mr. Balfour. He was succeeded by Mr. Balfour in 1909, and he was succeeded by Mr. Balfour in 1909.

Chairman—**Mr. HANSTEN,**
eldest son of the late
educational leader,
Liberator.

1892. He was Civil Lord of the Admiralty, 1895-1900; Financial Secretary to the Treasury, 1900-2; Postmaster-General and member of the Cabinet, 1902-3; Chancellor of the Exchequer, 1903-6.

Chamber of Commerce, an association of the principal merchants and traders of a town or district to promote and defend the interests of trade and commerce. The earliest known instance is at Marseilles at the end of the 14th century. This body consisted of a small number of representatives of merchants of the town, and had some share in the municipal government. It was formally reconstituted by Louis XIV., and during the last half of the 17th and beginning of the 18th centuries chambers modelled upon it were formed in various French towns—Lille, Bayonne, Montpellier, Dunkirk, and others. These chambers were abolished at the Revolution, but restored in 1802 by Napoleon. They were finally reorganised by Napoleon III. as President and Emperor in 1851 and 1852. They are elected by and from the principal commercial men in the area (the department or arrondissement) which they represent, and their duty is to make representations to the Government with regard to the customs duties, legislation respecting commerce, and other matters affecting its interest, and to present plans for its better promotion.

Two Scottish chambers, those of Glasgow and Edinburgh, are legally incorporated, but the English chambers are all purely voluntary associations, elected from the commercial men (excluding retail traders and employees) in a town, and meeting at intervals to deliberate on matters affecting their common interest. A central organisation, the Associated Chambers of Commerce, was formed in 1882. In America such societies also exist, and in various Continental countries; but the term in America is sometimes applied to the buildings where merchants meet to deal with one another. [EXCHANGE.]

Chambers, ROBERT, LL.D., publisher and author, was born in 1802 at Peebles. His *Traditions of Edinburgh*, 1824, attracted the notice of Sir Walter Scott, and the encouragement thus earned stimulated him to further literary exertion. In 1832 he joined his brother William, the success of whose *Journal* was now assured. In 1844 appeared *Vestiges of Creation*, but not until ten years later was the author of this remarkable work known. He wrote many other books of historical and literary interest, but his health broke down owing to overwork, and he died at St. Andrews in 1871.

Chambers, WILLIAM, was born in 1800 at Peebles. On the removal of the family to Edinburgh he was in 1813 apprenticed to a bookseller, and in 1819 started in business for himself. His beginnings were small, and his struggles, most interestingly told in his *Story of a Long and Busy Life* by himself, were severe. At length, in 1832, he started *Chambers's Edinburgh Journal*, the famous pioneer of periodical literature. Thereafter, in conjunction with his brother, Robert, he produced several serial publications of a popular and informing character.

such as the *Cyclopædia of English Literature, Information for the People, Papers for the People*, and *Chambers's Encyclopædia*. He won the usual rewards of a well-spent life; was elected twice Lord Provost of the Scottish capital, was granted the degree of LL.D. by the university of Edinburgh, and shortly before his death was offered a baronetcy. He died in 1883.

Chambéry, a city of France, in the department of Savoy, is situated in a beautiful district on the river Laisse. It has a cathedral, the old castle of the Dukes of Savoy, and the palace of justice. It is an archbishop's see, and in its vicinity is the château of Les Charmettes, at one time Rousseau's residence. Among the town's manufactures are clocks, wine, soap, and textile fabrics. It has excellent baths and is a favourite summer resort.

Chambord, a village of France, in the department of Loir-et-Cher, is celebrated for its château, formerly one of the finest royal castles in France. This magnificent edifice was commenced in 1526 by Francis I., and completed under Louis XIV. As a residence of the French kings down to Louis XV. it acquired the name of the "Versailles of Touraine." Louis XV. gave it to Marshal Saxe, and Napoleon, in 1809, gave it to Marshal Berthier, from whose widow it was purchased in 1821 for 1,542,000 francs by some Legitimists and presented to the Duke of Bordeaux. Its park is about 21 miles in circumference, and reputed one of the finest in Europe.

Chambord, HENRI CHARLES FERDINAND MARIE DIEUDONNÉ, COMTE DE, was born in 1820 in Paris. His father, the Duc de Berri (q.v.), had been assassinated seven months before, and the day the child was baptised he, then Duke of Bordeaux, was presented with the château of Chambord (q.v.) by a group of Legitimists in the name of the people of France; hence the title, Comte de Chambord, assumed in 1844, by which he became generally known. Though Charles X., in the July revolution of 1830, abdicated in favour of his grandson, the young count was obliged to leave the country, and lived successively at Holyrood palace, Prague, Görz, and London. In 1841 he had the misfortune to be lamed for life by a fall from his horse. He is regarded to have lacked decision and to have neglected to seize the opportunity of becoming Henry V. three times—in 1848, in 1870, and in 1873. After a long illness he died at his castle of Frohsdorf, in Austria, which he inherited in 1851, on August 24, 1883. He left no issue, and his claim descended upon the Comte de Paris.

Chambre Ardente, in French history originally a room draped with black and lighted by many torches (whence the name), where state criminals of high position were tried. Afterwards the name came to be applied to "special commission" courts, instituted for the trial of particular offenders. Francis I. established such a court for the trial of Protestants in 1535. It lasted for twenty-five years. Another was instituted in 1680 to try suspected poisoners in consequence of the alarm aroused by the murders committed by the Marquise de Brinvilliers, and another in 1716, which was

abolished in the next year, to try farmers of the revenue for alleged frauds.

Chameleon. [CHAMÆLEON.]

Chamfer, in *Architecture*, (1) a slope or bevel, ordinarily produced by cutting away a corner so that the line produced by the cut makes obtuse angles with the sides formerly containing the right angle. (2) A rounded groove is sometimes called a "concave chamfer."

Chamfort, NICOLAS, *littérateur*, was born in 1741 in Auvergne. His brilliant wit gained him an entrance to the highest literary circles in Paris. An intimate friend of Mirabeau, he zealously espoused the revolution, was secretary to the club of the Jacobins, and was foremost amongst the attacking party at the storming of the Bastille. As a writer of anecdotes, Chamfort has never been surpassed. His wit, however, cost him his life, for on account of some cutting innuendoes he offended the Jacobins, who threatened to have him arrested. To avoid this indignity he attempted suicide, and inflicted upon himself serious wounds from which he died after several days' suffering, April 13, 1791.

Chamier, FREDERICK, naval officer, novelist, and historian, was born in 1796, his father being a member of the council of Madras. He entered the royal navy in 1809, attended the expedition to Walcheren, cruised in the *Arethusa*, 38, on the coast of Africa, and served, both ashore and afloat, with considerable distinction against the Americans. In 1815 he was promoted to be lieutenant, and, proceeding to the West Indies in 1824, became in 1826 commander of the *Britomart* on that station. He returned home in 1828, and did not succeed in again obtaining employment. In 1856 he assumed the rank of retired captain, and in 1870 he died. His chief works of fiction are *The Life of a Sailor*, 1834; *Ben Brace*, 1835; *The Saucy Arethusa*, 1836; *Jack Adams*, 1838; and *Passion and Principle*, 1842. He also, in 1837, edited and continued James's *Naval History* and published *A Review of the French Revolution of 1848*. His novels have little merit, but being mainly founded upon facts which are themselves very interesting, have always been favourites. Captain Chamier married in 1832 Elizabeth, a grand-daughter of Sir John Soane, the distinguished architect, and founder of the Soane Museum.

Chamisso, ADELBERT VON, poet, was born in 1781 at the castle of Boncourt, in Champagne. His parents being obliged by the outbreak of the French Revolution to seek refuge in Berlin, he became in 1796 a page to the queen, and in 1798 entered the Prussian service, which, however, he left in 1806, as he would not fight against his native country. Subsequently he turned his attention to natural history, and in 1815 accompanied a Russian exploring expedition in a voyage round the world as naturalist. On his return he became curator of the Botanical Gardens of Berlin, being elected to the Academy of Science in 1835. Though he wrote several works on natural history and botany, it is on his poetry that his fame rests. His ballads and songs are

masterpieces, and still retain their popularity. His most widely known production, however, is *Peter Schlemihl*, the story of the shadowless man, which has been translated into nearly every European language. He died in 1838 at Berlin.

Chamkani, an Afghan people at the foot of the Sufed Koh ("White Mountains") between Tira and Kuram east and west; appear to be a branch of the Orakzais detached from the parent stem at a remote epoch; three khels, each with numerous subdivisions: Khani, Azi, Khoja.

Chamois (*Rupicapra tragus*), a gregarious goat-like antelope, the sole species of the genus, ranging over the mountain systems of Central and Southern Europe into Western Asia. It was formerly much more numerous, and is now chiefly confined in Europe to the Bavarian and Styrian Alps, though some small herds still exist in the Swiss Alps. The male stands about 24 inches at the shoulder, and the female is somewhat smaller. The coat in summer is brownish-yellow, with a dark dorsal stripe, which is lost in winter, owing to the hair on the body becoming darker. The head is yellowish, and the hue deepens from the muzzle upwards. Both sexes have horns; these are about seven inches long, black, and cylindrical, parallel for some distance, then curving sharply backwards at the tip, and at the base of each is a peculiar gland, the function of which is not known. The horns are sold as souvenirs of Alpine travel, and are often used as the heads of alpenstocks. The voice is a goat-like bleat, but the sentinel gives a shrill whistle to alarm the herd when danger is near. The female bears rarely more than one at a birth, in the spring; the old males are for the most part solitary. These animals are remarkably agile, and have a peculiar power of ascending and descending precipices; their senses are also developed to a high degree, so that chamois-hunting is a very difficult and dangerous pursuit. The flesh is highly esteemed, and the skin is now also made from the skin.

Chamomile, or *Matricaria inodora* (L.), one of the *Compositæ*, is native to southern Europe, but is now cultivated on the Continent for medicinal purposes. The leaves are downy and much branched. All the florets tend to be blue. It contains a tonic and aromatic essential oil, existing in larger quantity in the wild form. The dried heads are used as a stomachic.

Chamounix, a town in the valley of the Arve, in the department of Savoie, France. It is one of the most famous resorts in the Alps, and is situated at an altitude of 1,250 feet. The town is built on a rocky slope, and is surrounded by mountains. The climate is very healthy, and the scenery is beautiful. The town is famous for its chamois hunting, and for its fine views of the Alps.

grandest glacier in the Alps. The name Chamounix is also borne by the village in the valley, which has now become so famous as a resort for tourists that upwards of 15,000 are yearly accommodated there, and in 1860 an English church was



CHAMOUNIX, WITH MONT BLANC.

(From a photograph by Messrs. Frith and Co., Reigate.)

opened. It is mainly upon these visitors that the inhabitants rely. At the village are stationed the best guides for Alpine climbing, and from it the most customary ascent of Mont Blanc is made.

Champa, a term applied collectively to numerous tribes in the upper valleys of Ladakh and the neighbouring Tibetan province of Rupshu; are of Tibetan stock and speech, and differ little from the Ladakhi proper, except that the chin is less receding and the mouth more expressive (*Fr. Drew*).

Champagne, a wine, which derived its name from the province of France where it is chiefly manufactured. White and red champagnes exist, and they are designated "sparkling" or "still," according to whether they effervesce or not on uncorking. The sparkling wines are the more common. The effervescence is due to the wine being bottled before the fermentation of the grape juice is complete. By the subsequent fermentation large quantities of carbonic acid gas are produced, which, by the produced pressure, liquefy, and on opening the bottles escape rapidly in gaseous form. The different varieties of champagne are due chiefly to difference in the soils, and to minutiae in the mode of manufacture. Imitations of the genuine wine are largely manufactured by impregnating light wines with carbonic acid.

Champagne, an ancient town of France, of which Troyes was the capital, now forms the departments of Maine, Haute-Marne, Aube, and Ardennes, besides portions of Yonne, Aisne, Seine-et-Marne,

and Meuse. Chief among its towns besides the capital were Bar-sur-Aube, Laon, and Rheims.

Champarty, or CHAMPERTY, a species of maintenance of litigation. It consists in the purchasing or bargaining over a thing in dispute between rival parties, with the object of maintaining and taking part in the litigation. It is not champarty if the parties to such purchase have a common interest, and a moral interest, as that of a parent in a child, suffices. Nor is it champarty to simply mortgage the property in litigation, with the object of raising the necessary funds to carry it on. Champarty is a misdemeanor punishable by fine and imprisonment. In Scotland this offence has no existence, *i.e.* it is not punishable. [MAINTENANCE.]

Champignon, the French name for mushrooms in general, applied in England to the small fairy-ring mushroom, *Marasmius oreades*, common on dry pastures. It is of a dull fawn colour, drying white, and is excellent eating, whilst the allied *M. urens*, acridly poisonous, is distinguished by having narrower gills.

Champlain, LAKE, separates New York state from Vermont. Its surface, 9·3 feet above sea-level, is upwards of 100 miles in length, and from one at its S. end to fourteen miles, at its N. end, broad. Its surplus waters are discharged into the St. Lawrence by the Richelieu river. It is also connected by canal with the Hudson river. It is named after Samuel Champlain, who discovered it in 1609.

Champlain, SAMUEL DE, French naval officer and explorer, was born in 1567 at Brouage, in Saintonge. During the years 1604-7, having made his first voyage to Canada in 1603, he explored the coasts, and in 1608 he founded Quebec. In 1620 he was appointed governor of Canada, and was captured by the English in 1629. Released in 1632 he went back to Canada, where he died in 1635. He wrote an account of his voyages.

Champollion, JEAN FRANÇOIS, scholar, was born in 1791 at Figeac, in the department of Lot. Early devoting himself to the study of Oriental languages, he, in 1816, became professor of history at the Lyceum of Grenoble. In 1824 he was sent by Charles X. on a scientific mission to Italy, and in 1826 was appointed director of the Egyptian museum at the Louvre. Two years later he went as the scientific head of an expedition to Egypt, and in 1831 a new chair of Egyptology was created for him in the Collège de France. In the following year, however, he died at Paris. His sagacity is seen in his interpretation of the Rosetta Stone (*q.v.*), whereby he was led to the discovery that the three systems of Egyptian writing—the hieratic, demotic, and hieroglyphic—were really one, and that the hieroglyphs represented not ideas but sounds. The results of his investigations were published at the public expense in 1824. Among his other works were *Grammaire Egyptienne*, *Dictionnaire Egyptien*, and *Monuments de l'Egypte et de la Nubie*. His unpublished MSS., which numbered upwards

of 2,000 pages, were purchased by the Royal Library at Paris for 50,000 francs.

Champollion-Figeac, JEAN JACQUES, archaeologist, brother of the preceding, who is distinguished by being called "the younger" usually, was born in 1778 at Figeac. He became librarian and Greek professor at Grenoble, whence in 1828 he removed to Paris as conservator of MSS. in the royal library there. From this post he went in 1848 to Fontainebleau as librarian to Louis Napoleon. He wrote a number of archæological and philological treatises, and died in 1867.

Chancel (Low Latin *cancelli*, lattice-work), the upper, usually the east end of the church, generally containing the altar or Lord's Table, and often somewhat higher than the rest of the building. In some old churches, however, it is slightly lower. It is usually allotted specially to the clergy and choir, and was held in early times to be specially sacred (as it now is by Roman Catholic and Anglican High Churchmen), and therefore was railed off, whence the name. During the Reformation there was much controversy as to whether service was to be said there or elsewhere in the church. The former practice gave great offence to many of the Reformers. A reading-desk was therefore often erected outside the chancel, and in some cases the Lord's Table was transferred to the body of the church. This latter usage, however, caused so much irreverence that Archbishop Laud ordered that the table should stand at the east end of the chancel, and be railed in—a practice which has been universal in England since the Restoration. The chancel is legally the rector's freehold, and he is bound to keep it in repair.

Chancellor. A chancellor is the principal judicial officer of a sovereign or other important dignitary, or of a diocese.

1. *The Lord High Chancellor* of Great Britain, on delivery into his custody of the Great Seal, becomes *ipso facto* the highest officer in the State, and takes precedence of every temporal peer. He is by virtue of his office a Privy Councillor and Prolocutor (*i.e.* Chairman) of the House of Lords by prescription. He appoints for the Crown all the magistrates of the country (the county magistrates being usually nominated by the Lord-Lieutenant of each county). In former times the Lord Chancellor was usually an ecclesiastic, few others being then conversant with writings, and he was keeper of the king's conscience, which title accrued to him as presiding over the Royal Chapel. He is also visitor (in right of the sovereign) of all hospitals and colleges of royal foundation and patron of all crown livings under the value of 20 marks in "the King's Books." At the present time he has 12 canonries and 650 livings in his gift. He is guardian of all infants, idiots, and lunatics, and has the general superintendence of all charitable uses in the kingdom. He was formerly the principal judge of the Court of Chancery and is now president of the Court of Appeal of the High Court of Justice, and of the Chancery Division of the High Court; all writs of summons (the commencement of actions) being

Chandos, an English family that traces its descent to a follower of William the Conqueror. A leading member was James Brydges, born 1673, who was created Duke of Chandos in 1719. Having held the office of paymaster of the forces abroad

from 1707 to 1712 he was enabled to build a palace at Canons, near Edgware, at a cost of £200,000. Here Handel lived for two years. On the duke's death the palace was pulled down. Later the title passed into the Grenville family, the representatives of which are the Dukes of Buckingham and Chandos.

Chandpur, a town of British India, North-West Provinces, is in the Bijnaur district.

Changarnier, NICOLAS ANNE THÉODULE, general, was born in 1793 at Autun. After serving in Algeria, he was appointed in 1848 provisional governor of that province, soon after, however, proceeding to Paris to take command of the National Guard. While opposing the Bonapartists in the Legislature he did not identify himself with the Orleanists or the Legitimists, and on the *coup d'état* of December, 1851, he went into exile. On the outbreak of the Franco-German war, however, he offered his services to Napoleon, and was shut up in Metz with Bazaine. After the war he entered the Assembly, and proved a valuable aid to Thiers in reorganising the army. He died in 1877 at Versailles.

Chang-Chow, (1) a city of China, in the province of Fokien, is about 30 miles S.W. from Amoy, which is its fort. It has silk manufactures. (2) A city in the province of Kiang-Soo, is upwards of 50 miles S.E. of Nanking.

Changeling, in folk-lore a fairy child left by the fairies in exchange for an unbaptised human child stolen by them. Popularly the fairies were supposed to steal beautiful children and replace them by ugly ones; hence the name came to mean a simpleton.

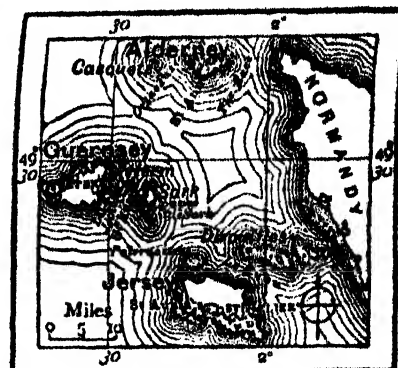
Change-ringing, the ringing of a set of bells in every way so as to obtain all the permutations possible.

Chang-Sha, a city of China, capital of the province of Hoonan, is situated on the Heng-Kiang.

Channel, THE ENGLISH, the narrow strip of water that separates England from France, extends from the Straits of Dover to Land's End, Cornwall. At Dover it is only 21 miles wide, and in its widest part it is 155 miles. At its eastern boundary it joins the North Sea, and the Atlantic at its western, the English coast-line of the Channel being 390 miles long, and the French 570 miles. It has a gentle current from W. to E. In France it is called *La Manche*, or "the sleeve," from its shape.

Channel Islands, THE, a group of islands in the English Channel, lie off the north-west coast of France. They belong to Britain, being the only remnant of the Norman possessions once subject to the English crown. The principal ones are Alderney, Guernsey, Jersey, and Sark (q.v.). Though the inhabitants are British subjects, the official language is French. The prevailing industry is agriculture, the land being apportioned in small holdings, and the proprietors labouring upon it with their own hands. The climate is very agreeable, and so mild that vegetation is several weeks in advance of England. The cattle of these islands

are famous, and are usually known by the name of Alderneys. The government is in the hands of bodies called "states," comprised of members



MAP OF THE CHANNEL ISLANDS.

appointed by the Crown and by the people. The islands are strongly fortified, and cover an area of 75 square miles.

Channel Tunnel, a proposed tunnel beneath the Straits of Dover, connecting Dover on the English side with Sangatte, near Calais, on the French side. The scheme was under discussion as far back as 1867, and has had the influential support of the late Prince Consort, Lord Beaconsfield, Mr. Gladstone, and others. Sir Edward Watkin, Bramwell, Low, Brady, Hawkshaw, and other engineers have given favourable opinions. The continual delays in the completion of the undertaking are mainly due to English hesitation for military reasons. The successful engineering of the tunnel seems assured, for the whole length of 23 miles could be cut along the bed of old grey chalk, impervious to water and well adapted for easy boring, which lies beneath the upper chalk bed of the Straits. A multitude of soundings have shown the continuity of this grey chalk without fault or erosion from one side to the other. Experimental cuttings at both ends have been made successfully for a mile or two under the sea, and the engineers report that very little water is encountered, this being fresh or brackish. The necessary pumping is, therefore, very slight. The tunnelling is rapid and easy, effected by the compressed-air boring machine, and no timber stays are required. Two single-line tunnels are proposed to begin with, one to ventilate the other. The line is to be worked by compressed-air engines. The inclusive estimated cost is £4,000,000.

Chansons de Gestes, the collective name of the old French epic poems dealing with the deeds (Lat. *gesta*) of various heroes, mostly belonging to the cycle of legends relating to Charles the Great. The *Chanson de Roland* is the best known.

Chant, in Music, a short melody sung to a psalm or canticle in places of worship. There are various kinds of chants, e.g. *Gregorian*, *Anglican*, *Parisian*, etc.; again, chants may be single, double, or even quadruple, though the latter are not common. In the *Anglican chant* the composition is divided into two parts, the first of three

and the second of four measures ; each part ends with a cadence. The method of distributing the words to be sung is known as *pointing*.

Chantibun, a town of Siam, is situated on a river near the Gulf of Siam. It exports pepper, cardamoms, etc., and near it are mines of precious stones.

Chantilly, a town of France, in the department of Oise, is situated on the Nonette. It is celebrated for its silk lace, the manufacture of which, however, is now dwindling. It is also the centre of French horse-racing. It was here that Condé built his splendid château, which the mob pulled down at the revolution. Rebuilt by the Duc d'Aumale, it is now reckoned, with its grounds, park, and forest, with an area of over 6,000 acres, to be worth about £2,000,000.

Chantrey, SIR FRANCIS LEGATT, sculptor, was born in 1781 at Jordanthorpe, Derbyshire. The son of a carpenter, who died while Chantrey was only 12, leaving his widow in poor circumstances, he was in 1797 apprenticed for seven years to a Sheffield carver and gilder. In 1802 he was able to cancel his indentures and to work for himself as a portrait painter. In 1805, after a short time at the schools of the Royal Academy, London, he was commissioned to execute a bust of the Rev. J. Wilkinson for the parish church of Sheffield ; other commissions followed, and in 1807, having married a lady of means, his struggle with poverty was ended. In 1808 he succeeded in the competition for the statue of George III. for the Guildhall, and henceforth the best work of his time fell to his lot. Becoming in 1816 an associate, he was elected a member of the Royal Academy two years later and knighted in 1835. His greatest work is the *Sleeping Children*, a statue group in Lichfield cathedral. Amongst the celebrities whose lineaments he chiseled were Watt, Wordsworth, Scott, Sir Joseph Banks, Pitt, Wellington, George IV., etc. In 1841 he died, bequeathing to the Royal Academy a capital sum worth £3,000 a year wherewith to buy the works of British artists. This is known as the "Chantrey Bequest," and many works have already been acquired with it. Chantrey excelled in his busts, his equestrian statues, and equestrian statues exhibiting many virtues.

Chantry (Fr. *chantry*), a chapel where masses were said for the soul of the founder or benefactor. They were often endowed, and often they were disendowed and the first year of Edward VI.

Chanzy, ANTOINE (1823-1893), a French general, was born in 1823. He served for a year as a sailor, entered the army in 1841, and two years later was promoted lieutenant. He distinguished himself in the Franco-Prussian war of 1870-71, and was promoted to the rank of general. He was killed in the war of 1870-71. He was a member of the National Assembly and the Chamber of Deputies. He was also a member of the Académie des Sciences et des Lettres.

At Le Mans in January, 1871, his army was almost destroyed by Prince Frederic Charles. In February he was elected member of the National Assembly, and in March was held prisoner by the insurgents. In 1872 Thiers made him a member of the committee of defence, and in 1873 Marshal MacMahon made him governor-general and commander-in-chief in Algiers. In 1879 he was ambassador to Russia, but in 1881 he resigned and was made commandant of the 6th corps d'armée. His death, a few days after that of Gambetta, was much regretted even in Germany, where he was much esteemed, and he received a public funeral. He wrote (1871) *The Second Army of the Loire*.

Chaos, in Greek mythology, the primordial undifferentiated matter which existed before the origin of the universe, and out of which it arose. Hesiod personified Chaos and called her the mother of Erebus (Darkness) and Nyx (Night). The word is commonly used as a synonym for confusion.

Chap-books (apparently akin to *chap*, cognate with *cheap*, denoting bartering), small books adapted for popular reading, usually consisting of wonderful tales, and hawked by *chapmen* or pedlars.

Chapel (probably from *cappa*, a cloak ; originally the tent in which was kept the cloak of St. Martin, carried to war by the early French kings), strictly speaking any building in which Divine service is carried on, other than the parish church. Such buildings, dedicated to some special saint or to the Virgin Mary, are always attached to cathedrals, sometimes to parish churches ; every college at Oxford and Cambridge has its chapel, as have some of the London City Companies and the Inns of Court, and some noblemen have domestic chapels. *Chapels of ease* in the Church of England are built for the accommodation of parishioners for whom the parish church is too small or too distant, and served by clergy from the parish church. They differ from the mission chapels of late years in being consecrated. Strictly speaking, Nonconformist and Roman Catholic places of public worship in England are called chapels.

Chapelain, JEAN (1595-1674), a French poet born at Paris. His first work was the translation of a Spanish romance, *Guzman d'Alfarache*. An ode to Cardinal Richelieu brought him a pension and the reputation, both in his own opinion and that of others, of being a poet, and he had great influence in forming the academy. He considered himself the first poet of France, and projected an epic in twenty-four cantos, *The Maid of Orleans* ; but on the publication of the first twelve in 1656 the feebleness of the work brought him into ridicule, and the remaining twelve still remain in MSS. at the National Library. He also wrote *Mélanges en Prose*.

Chapels Royal are certain of the domestic chapels attached to palaces of the English Crown—two, an Anglican and a Lutheran, at St. James's palace, one at Whitehall, and minor chapels at Kensington and Hampton Court palaces. The name is also applied to the chapel of the Savoy,

originally a palace chapel, which, however, is under the direct control of the Crown. The rest are governed by a dean, who is always the Bishop of London, and a sub-dean, and have other officials attached. Preachers in Lent are selected by the dean and approved by the Crown. The Boyle lectures (q.v.) were appointed to be delivered at the Chapel Royal, Whitehall. This latter was built by Inigo Jones for James I. as a banqueting hall, and converted into a chapel under George I. The Maundy alms (q.v.) were distributed there by the Sovereign. In October, 1890, this chapel was closed in conformity with the recommendation of the Chapels Royal Commission.

Chaplain, originally a clergyman who performed service in a chapel, now by custom applied to (1) the clergy specially retained by sheriffs and judges; (2) the examining chaplains of bishops, who act as their secretaries, and assist in examining candidates for orders; (3) the King's chaplains, forty-eight in number, thirty-six of whom are chaplains in ordinary, with a salary of £30 per annum each, and twelve are honorary chaplains and unsalaried; (4) the clergy retained as domestic chaplains by some English noblemen, nominally to read the service in the domestic chapels of their mansions; (5) the ministers of Anglican congregations abroad, including the clergy attached to British embassies and consulates; (6) the Anglican clergy, 160 in number, attached to the ecclesiastical establishment of the Government of India; (7) clergymen attached to hospitals, prisons, regiments, ships, or the House of Commons.

Chapman, GEORGE (1557-1634), English dramatic poet, contemporary and friend of Shakespeare and Ben Jonson. He went to Oxford at the age of 15, and is thought to have travelled afterwards in Germany. His first poem, *The Shadow of Night*, he published when 35, and four years afterwards he began the translation of *Homer's Iliad*, a work which, published at intervals, he finished in 1611. In 1616 appeared his edition of the *Iliad* and the *Odyssey* complete, and in 1624 *The Battle of the Frogs and Mice*, and the *Hymns and Epigrams*. His translation was approved by his contemporaries Jonson and Drayton, and has won the admiration in later days of Pope, Coleridge, Lamb, and Keats. He also translated Hesiod's *Works and Days*, and parts of the *Fifth Satire* of Juvenal. His earliest play, the *Blind Beggar of Alexandria*, was popular, and was printed in 1598, and one play, *Bussy d'Ambois*, was popular after the Restoration. Of his comedies, *All Fools*, *Monsieur d'Olive*, *The Gentleman Usher*, and *The Widow's Tears*, are distinguished by much humour and graceful poetry, and two plays upon Marshal Biron's history, though without dramatic merit, show lofty thought, and are good poetry. His *Cæsar and Pompey* also contains much that is good. Lamb was of opinion that Chapman of all Elizabethan dramatists came nearest to Shakespeare "in passages which are less purely dramatic." He is described by Anthony Wood as "a person of most reverend aspect, religious, and temperate," and appears to have been of haughty and austere

habit. His friendship for Jonson and Shakespeare, supposing that such a friendship existed, does not appear to have prevented him from leaving a posthumous fragment of satire upon the former, or from having given cause for passionate protest from the latter, if Mr. Minto's conjecture be true—and there seems much ground for it—that some passages in Shakespeare's sonnets refer to Chapman. Chapman's complete works (3 volumes), with essay by Mr. Swizburne, appeared in 1873-75.

Chapone, HESTER (1727-1801), an English authoress, daughter of Thomas Mulso, born in Northamptonshire. She had considerable accomplishments, and showed an early turn for literature, since in her tenth year she wrote a short romance. The best known of her works is *Letters on the Improvement of the Mind* (1772), but she also wrote in *The Rambler*, *The Adventurer*, and *The Gentleman's Magazine*.

Chapped Hands. This condition is caused by exposure of the skin of the hands to cold and moisture. It is particularly apt to occur in those whose occupation leads them to often have their hands in water, and who neglect to carefully dry the hands after each ablution. Attention to this latter particular will in itself, as a rule, put an end to the trouble. After applying the towel thoroughly, the hands should be held before the fire for a brief space, until every suspicion of moisture is removed. Various applications (the basis of most of which is glycerine) are said to expedite the cure.

Chappell, WILLIAM (1808-1888), member of a London music publishing house, and author of a learned work upon ancient English music. In 1838 he began to publish a collection of *National English Airs*, and between 1855 and 1859 published *Popular Music of the Olden Time*, in 2 volumes, the first volume of which forms a complete volume of known English airs down to the time of Charles I., the second being a selection of the most important airs of later date. In 1874 he published the first volume of a *History of Music*. Mr. Chappell was an F.S.A., and had much to do with the foundation of the Musical Antiquarian Society and the Percy Society, for both of which he did work in editing and annotating.

Chapra, a town on the river Gogra in Bengal, capital of the Saran district, and close to the junction of the Gogra and the Ganges.

Chaptal, JEAN ANTOINE (1756-1832), a French chemist and statesman. Born at Nogaret, Lozère, he studied chemistry at Montpellier, and obtained his doctor's degree in 1777, and went to Paris. In 1781 he was recalled to Montpellier to occupy a chair of chemistry there founded, and inheriting a fortune from an uncle he established chemical works. His labours brought on him the attention of Government, which gave him the cordon of St. Michael, and ennobled him as Comte de Chanteloup. The publication of a political pamphlet caused his arrest, but he was soon liberated. In 1798 the First Consul made him a councillor of state, and he was minister of the interior after Lucien Bonaparte. In this capacity

he did much for art and science, being among other things the introducer of the metrical system of weights and measures. He retired from office in 1804, but the Emperor gave him the Grand Cross of the Legion of Honour. After the downfall of Napoleon he retired into private life, but in 1816 Louis XVIII. nominated him a member of the Institute of Sciences.

Chapter, a body of ecclesiastical persons in a cathedral church, consisting of canons (formerly known as prebendaries), whereof the Dean is the head, all subordinate to the Bishop, to whom they act as a council of assistants in matters relating to the Church for the better ordering and disposing the things thereof. The Dean and Chapter formerly assisted the Bishop in the ruling and government of the diocese in the time of vacation. The members of the College of Arms, that is, the king's heralds and pursuivants, are said to hold a chapter when they confer on the business of their office, and in like manner chapters of the Order of the Garter are held.

Chapter House, the hall in which the chapter (q.v.) of a cathedral hold their meetings. Many of those belonging to English cathedrals are of great architectural importance and beauty.

Chara, a genus of plants of great botanical interest. They are aquatics occurring in fresh or brackish waters, especially when stagnant, in most parts of the world; and are often much encrusted with lime, so as to become brittle, and are hence known as stone-worts. Their stems, which rise from the bottom often through several feet of water, are very slender, consisting of *internodal cells*, often several inches long, surrounded by a circle of *cortical cells* and separated by *nodes*, from which spring the cortical cells, whorls of branches, and the sexual organs. The cortex is developed upwards and downwards from each node so as to meet that from the next node halfway along the internode. The cells contain numerous chlorophyll-grains which exhibit very clearly the rotation of the protoplasm. Growth takes place by the division of a large apical cell. The reproductive structures, both of which are very distinct from those of other plants. The antheridium or male organ is a small sphere, enclosed by four *shields*. From the centre of the sphere, called *manubrium* or *style*, rises a long *capitulum* which in its turn bears four *antheridia*, each bearing four *antheridia*, there being in all 192 *antheridia* and 200 cells, each containing a *rosette*, resembling a *gonium* or *gonium* surrounded by five *gonidia*. After the *antheridia* are between the *antheridia* and the whole *antheridium* forming a *gonium* on which *antheridia* occur.

from their markings as *gyrogonites*. *Chara* is now generally classified either near the mosses or among algæ.

Character (Greek *character*, a sign or engraved mark), a term applied in a variety of senses, among them (1) to the form of writing or printing, or the letters used in it; thus Russian is said to be written in the "Cyrillic character;" or to the signs employed in music; (2) to the group of qualities and habits that distinguish an individual or a nation; (3) to the parts in a play; (4) to eccentric or remarkable persons; (5) to the certificates as to past conduct and abilities, given to servants, etc., on leaving. In natural science it is a short definition expressing the distinguishing marks of a plant or animal. In its legal aspect it has several bearings. 1. In regard to a *criminal prosecution*, a defendant is allowed to call witnesses to speak generally to his character, though he is not allowed to prove particular actions bearing favourably on his character, unless they happen to stand in connection with some of the facts charged and proved against him. On the other hand the Crown seldom, in practice, seeks to put in evidence of generally bad character, and, though under certain circumstances, it may give proof of a previous conviction for crime, yet this must be within the restrictions imposed by the Legislature.

2. *As to Witnesses*. Evidence is admissible to show that a witness is unworthy of credit by reason of his general bad character, and if he is asked whether he has been convicted of felony or misdemeanor, and denies or refuses to answer, the opposite party may then prove the conviction.

3. *As to Servants*. If any person shall personate a master, and give a false character to a servant or assert falsely in writing that any servant has been hired for a period of time or in a station, or was discharged at any time, or had not been hired in any previous service, or if any person shall offer himself or herself as a servant pretending to have served or with a false certificate of character, or shall alter a certificate, or shall (contrary to truth) pretend not to have been in any previous service, the offenders in any of the above cases are liable under a statute passed in the 32nd year of the reign of George III., on conviction before two justices of the peace, to be fined £20, and in default to be imprisoned with hard labour for any time not more than three nor less than one month.

4. *As to parties to a civil action*. Evidence as to the character of a party to a judicial proceeding is not generally admissible, unless the nature of the proceeding is such as to put his or her character in issue.

5. *As to general representations* respecting the character or trade ability of a person, to whom credit is to be given on the faith thereof, these shall not render the party making them answerable for debts, which may have been contracted on the faith of them, unless they be in writing and signed by the party sought to be made liable thereon.

Charade (either from a French dialect-word meaning to chatter, or from a Spanish word for clown), a name applied (1) to a word given to be

guessed, the indication being given by some description of the meaning of each component syllable separately; (2) to a sort of improvised drama, the name of which is to be guessed from the action of the performers.

Charadriids, a large family of wading birds, containing the Plovers, Oyster-catchers, Sandpipers, etc.

Charadriomorphæ, in Huxley's classification a group of birds, equivalent to the family Charadriidæ (q.v.) with the Snipes and Bustards.

Charai (JARAI), a hill tribe of Indo-China on the left bank of the Sekong affluent of the Mekhong about the frontiers of Annam and Camboja; remarkable for their extremely fair complexion and Caucasian type in the midst of a Mongolic population. The language, which shows much analogy with Malay, possesses a peculiar character in which have been composed historical and other works. The Charais appear to be a fragment of the Cham nation [CHAM], who have lapsed into barbarism since the overthrow of the Cham power by the Annamese in the fifteenth century.

Charbon. [ANTHRAX.]

Charcoal. [CARBON.]

Charente, a French inland department, divided into five arrondissements, and having Angoulême as its capital. Generally level, save where the surface is broken by offshoots from the Limousin Mountains in the north, and by chalk-hills in the south, it is drained by the Charente, the Vienne, and the Dronne. Chestnut forests abound on the hills, and much wine is grown, which is for the most part distilled into brandy. Truffles also are plentiful. Felt, leather, paper, and pottery are the chief manufactures.

Charente-Inferieure, a maritime department of France, including the islands of Ré, Oleron, Aix, and Madame, and having to the E. Charente, to the S. the Gironde, and to the W. the Bay of Biscay. The surface is flat, and the department is traversed by many navigable rivers which are united by canals, and on the coast are many good harbours which carry on an extensive coasting trade. Brandy is manufactured from the wine of the district, and there are pilchard and oyster fisheries.

Charenton-le-Pont, a French town in the Seine department, on the bank of the Marne near its junction with the Seine. The bridge, which gives the town its name, is one of ten arches crossing the Marne, and connecting the town with Alfort, celebrated for its veterinary school. It is of great importance in the defence of the city, and is in the line of fortifications. There is a famous lunatic asylum at Charenton.

Charge, in *Electricity*. A body may be electrified in various ways; that is, it may be brought to a condition in which it exhibits certain electrical properties. [ELECTRIFICATION.] The body

is then said to possess a *charge of electricity*, this expression to be understood as meaning the amount of electrification. It does not in itself imply that electricity is a form of matter, a subtle fluid permeating all matter and filling all free space, or a modification of the ether of the physicists, though certain of the properties of an electric charge may be in part explained by any one of these hypotheses. It states, however, that electricity may be measured. A charge may be *positive* or *negative*: a positive charge is similar to that produced on glass by rubbing it with silk; a negative charge is similar to that produced on sealing-wax by rubbing it with fur. Like charges repel each other, unlike charges attract. Electrical properties are only observable when one kind of electricity preponderates; and inasmuch as the normal state of things in a system of conductors is an exact neutralisation of the two kinds, the isolation of a charge of one kind in a body must involve the isolation of an equal amount of the opposite kind elsewhere. A charged, insulated, conducting sphere, for instance, placed in the middle of a room causes the accumulation of a charge of equal amount and of opposite kind on the inner surface of the walls of the room. This *induced* charge as it is called will remain *bound* so long as the insulated sphere retains its charge. And further, since unlike electricities attract each other, it follows that the charge on the insulated sphere must reside on its surface, a property common to all charged conductors. The insulating medium separating two charges has to oppose their tendency to unite or to separate still further, and is therefore subjected to strain. That it is thus strained has been made manifest in various ways. If the strain be too great the continuity of the insulator will be broken and the disposition of the charges will be changed. [DIELECTRIC.] The distribution on a body depends on its shape and on the position and shape of the neighbouring bodies. It is most intense in those regions on the surface of the body where the curvature is greatest. Hence the readiness of discharge at sharp points. An electrical charge admits of measurement, for the attractive or repulsive force exerted by two separate charges depends on their respective magnitudes and may be directly measured. The unit quantity is called the *coulomb*, and is such that if concentrated on a small conductor at a centimetre distance from an equally charged small conductor, a repulsive force of one dyne will tend to increase their distance apart.

Chariot. War chariots probably originated in Egypt (Exodus xiv.). They are seen in Egyptian and Assyrian paintings and were used by the Canaanites and the Hebrews. In the Homeric age in Greece the warrior was driven in a chariot—standing by the driver—along the hostile ranks, challenging the foe to personal combat. By 700 B.C. the chariot was only used for racing in Greece. It was on two wheels, open at the back, with a curved rim reaching about to the waist of the driver. Usually four horses were harnessed to it, abreast, the two inside ones yoked to the pole, the two outside more loosely attached. The races were on an oval course, the greatest skill being requisite

Charity Organisation, the effort by combined action and experienced direction to prevent misplaced, useless, or harmful charity. That there is great necessity for organisation in the distribution

Charity, PUBLIC. The systematic aid of the distressed was almost unknown before Christianity. Its modern growth has been doubtless greatly assisted by the substitution of free labourers for slaves, as the latter of necessity look solely to their masters for support. For various kinds of charitable institutions, see FOUNDLING HOSPITAL, NURSING MISSIONS, ORPHANAGES. Charity is far more developed in England than elsewhere, except in the United States. But Christian charity has too often assumed that the saying of its Founder, "The poor ye have always with you," refers to all time, and not mainly to small societies with fixed occupations and little mobility of labour, like that of Judæa in the Roman period. The wisest modern charity essentially aims at the promotion of self-help. Charities, public or otherwise, have always been much favoured by the law, for "no time," as Lord Coke observes, "was so barbarous as to abolish learning, or so uncharitable as to prohibit relieving the poor." Wherefore, when by a statute of Henry VIII. c. 10 gifts to *superstitious* uses were made void, gifts for *charitable* purposes were held not to fall within the provisions of that statute. By a statute of the 39th year of Queen Elizabeth's reign (made perpetual by a later statute) any person was enabled by a deed enrolled in Chancery to found a hospital and to give it a corporate existence, with capacity to take and purchase goods and chattels, lands and tenements, and this without the king's licence, his assent, consent, and subject only to these conditions:—that the gift was *freehold* in fee simple or for years; that the value did not exceed £10, and not exceeding £100 if the land comprised above and later statutes had limited the amount the legislature had been empowered to increase to charities. Abuses, however, grew up in connection with way, particularly the alienation of lands, disposing of lands by will, &c., which became common on the approach of death, and led to great waste of wealth, and therefore by the Statute in the 6th year of the reign of George I. (which was continued by many large Acts since), it was enacted that no man should make any conveyance of real estate to charity, unless he should first certify to the persons who are named in the Statute, that there shall be no other charge upon the same, nor any such condition, whereby the benefit intended shall be diminished, and that the said Act specifically relates to the disposal of real estate.

of charity is evidenced by the fact that it has been computed that in London alone from £4,000,000 to £7,000,000 is dissipated every year in indiscriminate almsgiving. In the endeavour to prevent such waste of money there are now over ninety societies working in Great Britain, and in America and Germany the movement has considerably developed. The "London Society for Organising Charitable Relief and Repressing Mendicity" is a federation of forty district committees, one or more in each poor-law division, and a central council. The committees investigate individually all cases referred to them; they supplement the poor-law, act as dispensers for special charities and private benefactors, procure pensions, employment, medical treatment, surgical appliances, entry to convalescent homes, hospitals, and almshouses, and give aid towards emigration; they also make loans and grants from their own funds; and they are generally representative of local philanthropy. The Council chiefly plans the wider application of the Society's principles and the suppression of imposture. It has also specially considered such subjects as exceptional distress, the management of medical charities, free meals for school children, poor-law out-relief, General Booth's scheme, etc. On these and other matters it has published papers; and it issues periodically the *Charity Organisation Review* and the *Charities Register and Digest*.

Charivari, the French equivalent for the "rough music" with which unpopular persons are sometimes saluted in France, as in our rural districts. It was not uncommon on the Continent of Europe during the Middle Ages, and was specially directed against those suspected of various matrimonial offences, in particular widowers or widows who married again, or wives who beat their husbands. The practice occasionally provoked interference by the Government, especially in France. The name was adopted by the prototype of *Punch*, the satirical paper *Charivari* of Paris, first published December 2, 1832. Felix Pyat and Lucien Reyband were amongst the earlier members of the editorial staff. The paper had to suffer twenty prosecutions during the reign of Louis Philippe.

Charlemagne (742-814), or KARL THE GREAT, the Napoleon of the Dark Ages, was the son of Pepin le Bref, and grandson of Charles Martel. In 768 he succeeded his father jointly with his brother Carloman in the kingdom of the Franks, and when at Carloman's death in 771 he became sole ruler, he wielded sway over a vast kingdom, and had great influence, besides being looked on as the bulwark of Christendom against the Saracens and the heathen of the North, and the protector of the Pope against the Lombards and the Greek empire. It was in 772 that he began the great work of his life—the conquest of the Saxons. These formidable enemies were the only remaining champions of the old Germanic power against the Franks, of the ancient religion of Odin against the new and aggressive

Christianity. After a severe struggle, in which Charlemagne took their stronghold of Ehresburg, and overthrew their idol Irminsul, the Saxons were forced to submit for the time. The king then turned his attention to the Lombards, whose king had invaded the Papal dominions owing to the refusal of the Pope to aid him against Charlemagne, whose wife, the Lombard king's daughter, had been divorced for barrenness. The result of this campaign was the subjugation of Lombardy, and the placing of the Iron Crown upon Charlemagne's head. A revolt of the Saxons brought the conqueror once more down upon them, and after two more campaigns he forced them in 777 to do him homage, and accept almost universal baptism. An invitation from Spain to intervene in the wars of the Arabs and Moors led to an expedition into Spain, which had the solid result of adding the territory as far as the Ebro to his dominions, and has proved a lasting theme to romancers and minstrels since. The king's rearguard was attacked in the pass of Roncesvalles, and Roland, with many other of the Frankish chivalry, lost his life. In 785 the Saxons—in spite of the severe lesson Charlemagne had given them in 782, when he massacred 4,500 prisoners—made what was almost a last despairing effort, only to be again crushed, and to see themselves deported into other provinces of the empire. In connection with this deportation it may not be uninteresting to point out the fact that in the Grand Duchy of Luxemburg there are in daily use a very considerable number of words which are almost absolutely identical with the English words for the same ideas, and it is said by tradition that the inhabitants of this region are descended from the Saxons transported thither by Charlemagne. In 788 Charlemagne added Bavaria to his kingdom, and in 791 his campaigns against the Avars, a Mongol race inhabiting what is now Hungary, ended in his becoming possessed of Pannonia. Many fights he had with the Wends and Danes and Czechs; but they all ended in the same way, and his sway extended over almost all Central Europe. In 800 he reached what seemed the height of ambition when he became Roman Emperor; but his views were even yet bolder, for he had conceived the idea of uniting the Eastern and Western Empires by a marriage with the Greek Empress Irene, a plan which was brought to naught by her fall. In 801 Charlemagne received an embassy from the Caliph Haroun Al Raschid, his Eastern counterpart.

That Charlemagne was something more than a conqueror is shown by his measures for organising and civilising his dominions. His establishment of counts of the marches, his sending representatives to ensure uniformity of system in different parts of his empire, his two yearly councils, one military, the other civil, his plan of uniting the Rhine and the Danube by a canal, all show great political foresight, and if his empire fell to pieces after his death, it was because the age was not yet ripe for it. Not only did Charlemagne encourage and court the acquaintance of learned men, he was also of no mean literary pretension himself, as some of his works show. Much of his success seems to

have been owing in some measure to his intense vitality and vigorous constitution, added to great intellectual power. "I conquered the world," he is made to say in Owen Meredith's *Legend of the Rhine*, "because God gave me a gizzard;" and there may be a germ of truth in this.

Charleroi, an important manufacturing town of Belgium, in the province of Hainault, on the Sambre, and about 33 miles S.E. of Brussels. It was formerly fortified, and has at divers times been a place of great military importance, notably in 1815 when Napoleon occupied it a few days before the battle of Waterloo. Being in the coal district it has great ironworks, nailworks, and smelting furnaces, and there is much manufacture of glass and hardware.

Charles, KARL LUDWIG JOHANN (1771-1847). ARCHDUKE OF AUSTRIA, third son of Leopold II. In 1796 he commanded the Austrian army on the Rhine, and defeated the French general Moreau at Rastadt. He also defeated Jourdain, drove the French across the Rhine, and took Kehl. In 1799 he again headed the army of the Rhine and again defeated Jourdain and held his own against Massena. In 1800 bad health compelled his retirement, and he was made governor of Bohemia, where he raised another army and stopped Moreau, till the conclusion of an armistice. In 1805 he commanded an army in Italy against Massena, was defeated at the battle of Caldiero, but made a good retreat into Croatia. In 1809 he won the battle of Aspern, but Napoleon checked him at Wagram, and pushed him back and back. Shortly afterwards an armistice was concluded, and the Archduke disappears from public life save for a moment after Napoleon's return from Elba.

Charles I. (1600-1649). King of England, son of James I., succeeded his father as King of Great Britain and Ireland in 1625, and married three months after his accession the French princess, Henrietta Maria, thus at the outset of his reign giving occasion to his subjects by an unpopular marriage. His reign was marked by misunderstandings and disputes, which culminated in his death upon the scaffold. It is impossible, in a limited space, to give a brief outline of the events of his reign, and of it would entail a volume as large as the most important and interesting parts of English history, much of which is treated under separate heads in the following pages. After the death of Charles was much of the reign of the "Long Parliament," which, with the exception of the "Interregnum," had much to do with the conduct of the war. In 1628 the "Right of Habeas Corpus" was established, and Charles did not, however, in 1640, once a liturgy was established.

Parliament once more, and the Parliament, refusing to vote money before the redress of grievances, was at once dissolved. It is called the "Short" Parliament. In the same year the "Long" Parliament was summoned, and under the leadership of Pym at once proceeded to most vigorous measures. Its first movements were to impeach Strafford, and to vote its own dissolution impossible without its own consent. Charles had the incredible weakness to sacrifice Strafford, and to confirm the Bill making the Long Parliament immortal. In 1641 the Parliament presented the Grand Remonstrance, and in 1642 the king took the step of going down to the House and demanding the surrender of five members, a proceeding which Parliament and the country at large looked upon as a breach of privilege. From this point events marched quickly. To nineteen propositions made in June, 1642, which would have greatly modified the constitution, the answer was open war. With fluctuating success the Civil war went on till the battle of Naseby, and the revelation of the king's duplicity which followed, led to the king's flight to Scotland in 1646. The next year his faithful Scots delivered him up to his foes, who, however, were now differently composed from heretofore. The army was now in the ascendant, and could dictate terms to the Parliament. Cromwell and Ireton, on behalf of the army, tried to make terms with the king, but the latter would not listen, and fled to the Isle of Wight from Hampton Court, where he had been kept in a kind of honourable captivity. Again Parliament tried to make terms, but the army took matters into its own hands and confined the king in Hurst Castle, from which they brought him to London. The Commons then, without the concurrence of the House of Lords, and in a House "purged" of those members who did not approve of the proceedings, constituted a committee as a High Court of Justice under Bradshaw as president; and in January, 1649, after a four days' trial, sentenced the king to death as a tyrant and traitor to his country. This sentence was carried into effect upon the 30th of January.

Charles II. (1630-1685), King of England, was born at St. James's Palace. He was present in 1642 at the battle of Edgehill, and in 1646 succeeded in escaping to France. After remaining in Paris for two years he proceeded to Holland, and in 1648 he made a futile expedition to the Thames. It was in this year that he offered to the Parliament *carte blanche*, provided they would only spare his father's life. He accepted the invitation of the Scots in 1650, and was crowned at Scone in 1651. Wearied with the Puritanism of the Scots, and hoping to make good his footing in England, he left Scotland in August, 1651, with 10,000 men upon the campaign that ended so disastrously at Worcester on the 3rd of September. The next few weeks of his life were exciting enough, till upon the 15th of October he was able to escape from England by embarking from Shorham for France. He spent three years in France, three years in Cologne, and three in the Low Countries, and then in 1660, in response to the invitation of General Monk and a majority of the nation, he arrived to take up his

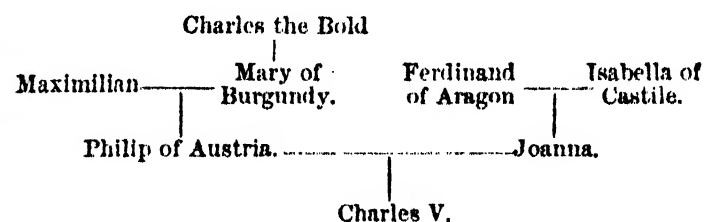
kingdom on the 26th of May. Scott gives a graphic account in *Woodstock* of his entry into London. His reign was not a very bright one for England, though it is hardly fair to charge its faults solely to the king. To exile him, and drive him from place to place, and then to expect him to come back when the nation pleased to change its temper, and take his place meekly, and live as decorously as though he had been comfortably installed at St. James's, instead of leading a shifty life upon the Continent, was expecting too much from human nature. After the Convention had made liberal terms with the king, the so-called Cavalier Parliament was called, which sat from 1661 to 1679, and saw many political changes. So long as Clarendon had influence things went comparatively smoothly, but after him troubles soon began. The acceptance of a subsidy from France in 1661, and the sale of Dunkirk in 1662, raised grave fears in the hearts of many, and when in 1667 the Dutch under De Ruyter sailed into the Medway, and burnt Chatham dockyards, the national disgrace seemed complete. In 1670 a secret treaty with France, and the acceptance by the king of a pension from Louis XIV., and the promise, with which he was credited, to endeavour to bring about the conversion of England, gave dire offence. With a view to counteracting French and Catholic influence the country almost forced the king to consent to the marriage of his niece Mary to the Prince of Orange. The year 1679 is memorable in English history as having seen the passing of the Habeas Corpus Act, which is looked on as the complement of the Great Charter, and as an almost equally valuable bulwark of English liberty. Whether the indulgence which was granted in the early part of the king's reign was intended to make things easy for the Catholics especially, or from a desire for general tolerance, is of little moment, since in any case it had the effect of making the king's government unpopular, and led to the sharp division of politicians into the court and country parties which existed in the latter part of the reign. The dread of the Catholic succession expressed itself in the readiness with which the country allowed itself to be gulled into a belief in the existence of a "Popish Plot," and was also the governing motive of the abortive "Rye House Plot." The Great Plague and the Great Fire of London are events which make Charles II.'s reign memorable.

The king's marriage with Catherine of Braganza almost escapes notice, since there were no children born of the marriage, and it is chiefly notable as leading to the founding of our Indian Empire, since Bombay was part of Catherine's marriage portion.

Of the king's character and actions it is difficult to judge fairly. Every allowance ought to be made, on account of the wandering life of his early years, and much of what was called his unpatriotic truckling to France may have been a feeling of gratitude towards those who had befriended him in adversity. That he was shrewd and clever we know, and that he treated most things with a cynical and careless good nature is established, but to put

him down as utterly selfish seems hardly warranted by facts. He tried hard to save his father, he resented the attempt to implicate his neglected wife in the supposed Popish Plot, and he risked much to prevent his brother's exclusion from the succession. It has been said that he was ungrateful to the Cavaliers who had made great sacrifices for the Crown, but it would have been impossible to satisfy all their expectations. Perhaps the gravest blot on his character is the fact of his allowing people to die for taking part in a plot which he did not believe to exist. On the whole, it is impossible not to like if one cannot respect "the Merry Monarch," who was "Old Rowley" to his intimates, was generous to his mistresses and their offspring, and who apologised to his courtiers for being "such an unconscionable time dying," and with almost his last breath bade them "not let poor Nelly starve." He at least was no hypocrite, and that in itself was a virtue at that epoch. Of his mistresses the most known are Nell Gwynn, who was a woman of many good qualities; Lucy Walters, the mother of the Duke of Monmouth; and Louise de Querouaille, whose house is still to be seen in Lincoln's Inn Fields decorated with the Rose and the Fleur de Lys. Possibly as good an idea of Charles's personality as can be formed is to be got from Scott's *Woodstock* and *Peveril of the Peak*.

Charles V. (1500-1558), Emperor, and one of the most prominent figures of the 16th century. He was born at Ghent.



Thus he inherited immense possessions—the Netherlands, Spain with her vast and constantly increasing colonies, and Austria. Until 1517 Charles lived in the Netherlands, where he had for one of his tutors the priest who afterwards became Pope Adrian VI. He was elected emperor in 1519 on the death of his grandfather Maximilian, and was crowned at Aix. But it was a thorny crown that he inherited. The Turks under Soliman the Magnificent threatened his eastern boundaries, Francis I. of France was a bitter foe, he had to face a revolt in Spain, and the stubborn Flemings of the Low Countries gave him constant trouble. Meantime he could never be sure of the Pope's friendship, nor of that of Henry VIII. of England. Another trouble of his reign was the growth of Protestantism, which had been taken up warmly by some of the German princes. Policy, therefore, inclined the king to make terms with it if possible. It was with this view that the Diet of Worms was held (1521), in which Charles was more or less gracious towards a movement he was far from approving. And a war with Francis I., which lasted for eight years, until 1544, made him less inclined to take

strong measures against the Protestants. In the same manner when the Diet of Augsburg was held (1530), the Turks were fully occupying the king's attention. In the same year an impossible compromise was attempted by the convocation of a Council, which at last met at Trent in 1545.

In 1546, the French war having ceased, Charles turned his attention to the Protestant princes and subdued them; but a few years later Maurice of Saxony, having beaten the French and the Turks turned the tables upon Charles. The French seized Metz—which they have held three centuries till the last Franco-German war—and the emperor's plans generally were abortive. He had been betrothed to Mary of England, but his son Philip married her in his place. In this case there was disappointment. The much-desired heir who should unite the Spanish and English crowns did not come, his own wife whom he had greatly loved had died many years before, his subjects troubled him, the hateful new religion made head, and he was wearied of life. He resolved upon abdication of his power, and retirement into private life. In 1554 he made over Naples to his son Philip, in 1555 he resigned the Netherlands to the Prince of Orange, and in 1556 he divested himself of the crown of Spain, and finally resigned the empire in 1558. He retired to a convent in Estremadura, near to which he built a house and occupied himself in congenial pursuits. Although no longer taking an active part in politics he kept a keen watch upon events, and often intervened with advice upon the affairs of the empire. One of his latest acts was to bequeath to his son a policy of intolerance, that policy which cost him his Low Country possessions.

Charles VII., of France (1403–1461), was the third son of Charles VI., and succeeded his father in 1422, being born in the stormy time that followed upon the English victory of Agincourt, which led to the acknowledgment of the claims of Henry V. of England, and to the marriage to him of Charles VI.'s daughter Catherine. Although King Charles VII. had no great qualities, his reign was memorable, since it restored France from subjection to independence, and produced such characters as Duncanson, the Duke of Burgundy, and in 1429 was forced to lift the siege. In 1435 a Burgundy marked the English rule, and in Castillon virtually Charles VI. was once more consolidated work he is said to be the noted Agnes little that was world

Charles Henry brother Catherine noted as Huguenot and the Duke of C

in favour of toleration; he married his sister to the Huguenot King of Navarre, and welcomed Coligny at Court, and was indignant at the attempt to assassinate him, and yet in 1572 when the massacre of St. Bartholomew took place the king was aiding and abetting, even firing upon the fugitives with his own hand. It is doubtful whether he did this owing to his mother's influence and persuasion, or whether he had been induced to believe that the Huguenots had formed a plot against his life.

Charles X., of France (1757–1830), third son of the Dauphin of France, and grandson of Louis XV. He married Maria Theresa of Savoy, and, as the Comte d'Artois, made some half-hearted attempts to make good the Royalist claims. In 1814 he made his appearance in France as lieutenant-general of the kingdom and leader of the Royalist party. When Louis XVIII. died in 1824, the count succeeded as Charles X. He made it his plan to carry out the old despotic ideas of the monarchy, and succeeded in provoking a revolution in 1830, which resulted in his deposition and the election of Louis Philippe d'Orleans as king.

Charles X., of Sweden (1622–1660), succeeded to the throne in 1654. He was very warlike, and in the second year of his reign he made war upon and subdued Poland. He then made himself Lord of Prussia, and again attacked and subdued Poland. His next attack was upon Denmark, in the course of which he crossed the Great and Little Belt upon the ice. As the result of the war he obtained the freedom of Swedish ships from paying toll on passing through the Sound (1658). He proposed to England and Holland to join in an attack upon Denmark and to share it with him. The States General and Cromwell both refused. He then invaded it alone in 1659, but was defeated, and the next year he died.

Charles XII., of Sweden (1682–1718), succeeded his father at the age of 15. As he was so young his neighbours, who had not forgotten the aggressions of his grandfather, Charles X., thought that their turn had come, and Frederick of Denmark, Augustus of Poland, and the Czar Peter of Russia, all resolved to fall upon him. The Danes began, but an Anglo-Dutch squadron aided Charles by threatening Copenhagen, and Denmark was obliged to abandon her intention. In 1700 Charles defeated the Russians at Narva; he then proceeded to dethrone the king of Poland; and in 1708 he made a sudden incursion into Russia, and nearly succeeded in capturing Czar Peter, drove the Russians before him, and had the way open to Moscow, when he all at once turned south towards the Ukraine in order to effect a junction with some forces which the Cossack Mazeppa had promised to bring to his aid. Mazeppa, however, was not able to keep his promise; the Czar cut off Charles's reinforcements from Sweden, beat him at Pultowa (1709), and the king was obliged to flee to Turkish territory at Bender. Russian agents—apparently then as ubiquitous as now—caused him after a time to be violently expelled from Turkey, or rather to escape to save his life, and in 1714 he was back in his own country. In 1716 he attacked Norway, and then formed a scheme of making peace with the Czar, taking

Norway, and restoring the Stuarts to the throne of England. In 1718 he again attacked Norway, and was killed at the siege of Friedrichshall by a musket-shot while recklessly exposing himself outside the entrenchments. There were rumours that he died by a shot from his own side, and accusations were brought against some of his officers, but could not be proved. A surgical examination of the skull at a later period gave countenance to this view owing to the ignorance of the doctors, who thought that the hole made by the exit of the bullet was caused by its entry. A recent examination has proved that the bullet came from the direction of the city, and that it was fired from a higher level than that occupied by the king. This enthusiastic madman was a thorough soldier, simple in dress and habits, shared all the privations of his men, and was as much beloved by them as Napoleon I. was by his soldiers. The *Life of Charles XII.* by Voltaire, though not accurate in all particulars, is well written and is of great interest.

Charles XIV., of Sweden and Norway (1764-1844), was by birth a Frenchman (Jean Baptiste Jules Bernadotte), the son of a lawyer at Pau. In 1780 he became a soldier, and by 1804 he had worked his way up to the rank of Marshal of France, and had greatly distinguished himself under Napoleon in Italy and in Germany. But eventually Napoleon became jealous of his great general, and Bernadotte left the army and returned to Paris. In 1810 he was elected Crown Prince of Sweden and heir to the throne. He took part with the Allies against Napoleon, but an unaccountable delay, which prevented him from doing anything of importance, is supposed to have arisen from his unwillingness to attack France. In 1818 he succeeded to the throne, and did much to further the well-being of the country which had adopted him.

Charles Albert, King of Sardinia (1798-1849), son of Charles Emmanuel of Savoy. He succeeded to Savoy in 1800, and in 1817 he married the daughter of the Archduke Ferdinand of Tuscany. At the revolution in Piedmont in 1821 Victor Emmanuel abdicated, and Charles Albert was regent until the arrival of Charles Felix. The latter, however, did not approve of his measures and annulled many of them. In 1831 Charles Felix died, and Charles Albert became king, and in him the hopes of Italian freedom were centred. But he was too prudent for the hot heads of young Italy, and Mazzini disapproved of him. In 1848 the war broke out against Austria, and Charles lost ground. In the battle of Novara against Radetzky (1849) he was defeated, and abdicated the throne. He retired to Portugal, and died there broken-hearted.

Charles Edward. [STUART.]

Charles Martel (about 688-741), natural son of Pepin d'Heristal, Duke of Austrasia and Mayor of the Palace to the Merovingian kings of France, was chosen by the Austrasians as their duke in spite of Pepin's disposal of the mayoralty to a grandson. He passed his life in fighting, subduing the Neustrians and making himself mayor of the

palace, forcing the Duke of Aquitaine to do homage to the French crown, driving back the German tribes, and forcing the Frisians to embrace Christianity, and finally, in 737, not taking the trouble to nominate another king upon the last king's death, he became real King of France, without, however, taking the title. But he is most noted for the victory he won in 732 at Tours over the Saracens, a victory which gained for him the name "Martel"—the hammer, and by checking the northward march of the Saracens probably changed the whole future history of Europe. At his death he divided his dominions between his two sons, Pepin and Carloman, and at the death of the latter, Pepin succeeded to the whole, and took the title of king, which power and title he handed on to Charlemagne (q.v.).

Charles the Bold (1433-1477) was the son of Philip the Good, Duke of Burgundy. While still Count of Charolais, he was the great enemy of Louis XI. of France, and with the aid of the Duke of Brittany and others, he defeated Louis at Montlhéry. He succeeded to the dukedom in 1467, and made it his ambition to make his duchy independent of France. Louis proposed a conference, and imprudently put himself in Charles's power at Peronne, just at the moment that the Liégeois revolted and killed their prince-bishop. Charles, who thought that the insurrection was fomented by French agents, a view whose truth or falsehood has never been clearly settled, was greatly enraged, and for a time Louis's life was in danger. Finally the duke insisted on the king's presence at the chastisement which he inflicted upon Liège, and forced from him some important concessions. This story is well told by Scott in *Quentin Durward*, the facts—with which, however, he takes some liberties—being based upon the statements of Philippe de Commines.

In 1475 Charles took Lorraine, and in the next year attacked the Swiss, who proved a more formidable enemy than he expected. He stormed Granson, but was soon after defeated in the vicinity, and in the same year he received another defeat at Morat. In 1477 occurred his last battle, that of Nancy, caused by an attempt of the Duke of Lorraine to get back his territory. After the battle Charles's body was found dead in a ditch. Charles was a good soldier, and had good intentions in the method of government, but he was liable to fits of mad anger, in which no considerations of prudence or justice restrained him, and he often gave dire offence by his violence.

Charles d'Orleans (1391-1465) was the grandson of Charles V. of France, and the father of Louis XII. Being made prisoner at Agincourt, he was carried to England, where he passed twenty-five years in captivity before the payment of his ransom set him free. He set up his court at Blois, where he occupied himself with poetry, and he has been considered by some as the father of French lyric poetry. His favourite composition was the *rondel*, and his subjects Love and Spring.

Charleston, a port of the United States, capital of the county of the same name, and the

largest and chief commercial port of South Carolina. It is situate upon a tongue of land between the rivers Ashley and Cooper, which here form a spacious harbour of seven miles by about two, and land-locked on all sides except the entrance, which admits vessels of under 18 feet draught. The harbour is defended by Fort Sumter—of Civil war renown—and Fort Moultrie, and also has forts inside. The town, which has a water front of nine miles, is well laid out, and has two main avenues with cross-streets from river to river, and presents a very striking appearance from the harbour, as its buildings, owing to the flatness of the land, seem to rise out of the sea. North and south of the entrance are Sullivan's and Morris's islands, the former of which is a popular bathing place, and at the entrance is a lofty lighthouse. Charleston is of great commercial importance as the chief outlet for the cotton and rice of a large district, and there is also a large coasting trade in cotton, rice, phosphates for manure, and lumber, a large deposit of bone phosphate existing in the neighbourhood of the city. There are large rice, cotton, and other mills, and sulphuric acid is extensively manufactured; and there is a large wholesale trade in dry goods. Charleston is the seat of a Catholic and of an Episcopal bishopric, and the churches are numerous, as are also the schools and other places of education, among which is the state military academy. The city is well and elegantly laid out, has abundance of trees, and a good water supply from a deep artesian well. Founded by English settlers in 1680, the town was twice attacked unsuccessfully by the British forces during the War of Independence, and was finally taken in 1780 and held for two years. The bombardment of Fort Sumter was the first overt act in the Civil war, and after its surrender the Confederates held the city till 1865, when they evacuated it, after setting fire to all the important buildings, upon the advance of General Sherman.

Charleston, the capital of Kanawha county and of West Virginia, is the junction of the Elk with the Great Kanawha river, 20 miles north-west of Richmond. It is a coal and salt.

Charlet, NICOLA, a Frenchman, a Parisian designer and engraver of military subjects. In his youth he was in the Mairie as a registrar, and was afterwards by the Bourbon party in the French army, where he soon made himself famous by his designs and drawings of military subjects. He had a country life, and was a member of the Académie. He had a son, also a designer, and a daughter, who was married to a Frenchman.

Charlotte, the capital of the North Carolina department, is situated on the banks of the Cape Fear river, and is a city of some importance. It is an export of cotton, and has a large number of spirits, and a large number of factories.

Charlotte of Wales, PRINCESS (1796–1817), the daughter of George IV.—then Prince Regent—and Caroline of Brunswick. She was brought up in great seclusion, and while still young was engaged to Prince William of Orange, an engagement which she broke off, much to her father's disgust, in 1814. In 1816 she married Prince Leopold of Saxe-Coburg (afterwards Leopold, King of the Belgians), and died the next year in child-bed.

Charlottenburg, a Prussian town on the Spree, four miles west of Berlin, and connected with it by a fine promenade. It is a favourite resort of the inhabitants of Berlin, and in the mausoleum in the castle grounds are buried Frederick William III. and his wife, and their son, the Emperor William I., and the Empress Augusta. The castle was built in 1696 for the Electress Sophia Charlotte, after whom the town was called. There are spinning-mills, breweries, and distilleries, and oil factories, and there is an artillery and engineering school, and a royal institute of glass-painting.

Charlottetown, the capital of Prince Edward Island in the Dominion of Canada, on the left bank of the Hillsborough river, which, by its junction with York river, forms a good harbour by which the largest vessels can ascend the river for many miles. There are shipbuilding yards, an iron foundry, a woollen factory, and several churches and colleges.

Charm, a form of words repeated or written with intent to bring about some supernatural result. The word passed into English through the French, from the Latin, in which language it was originally applied to a magical formula (*Hor. Ep. xvii. 4*), and, by extension, to any magical rite (*Verg. Ecl. viii.*). A similar extension of meaning has taken place in our own use of the word.

Charnel House (Latin, *carnalis*, from *caro*, *carnis*, flesh), a mortuary chapel or vault containing the bodies or bones of the dead. In some Roman Catholic countries (*e.g.* Brittany, and parts of Switzerland) it is customary, after the flesh of bodies has decomposed, to transfer the skulls and some of the larger bones to such chapels (called *ossuaires* in Brittany), where they are arranged on shelves. The crypts (q.v.) of churches were sometimes employed thus in mediæval England, and there are numerous skulls in a building attached to the church of Hythe in Sussex.

Charon, in Greek mythology the Son of Night and Darkness, whose duty it was to ferry the dead across the river that separates this world from the next, receiving as his reward the death-penny that was placed in the mouth of every corpse.

Charpie (French, *charpie*; Latin, *carpo*, I pluck), a preparation of linen for dressing wounds.

Charr, the popular name of a group (*Salvelini*) of the genus *Salmo*, distinguished by the absence of teeth on the body of the vomer (q.v.) from true salmon and trout (*Salmones*), which they resemble in form and habit. Charr are found principally in mountainous lakes, frequenting clear water, and

feeding on insects and Entomostraca, to the latter of which the pinkish tinge of the flesh is probably due. Dr. Günther records thirteen species, of which the most important are, *Salmo umbla*, from the Swiss lakes; *S. salvelinus*, from the highlands of Austria and Bavaria; *S. alpinus*, the northern charr; *S. willughbii*, from Windermere; *S. hucho*, sometimes called the bull-trout (q.v.), from the Danube, and *S. fontinalis*, the brook-trout of American authors, recently introduced into British lakes. Other species or varieties are recorded from Scotland, Wales, and Ireland.

Charron, PIERRE (1541-1603), a French philosopher, who, after studying law at Orleans, practised as an advocate in Paris. Failing at the bar, he entered the church and became a great preacher, and formed a friendship with Montaigne, who had much influence over him. From being the great champion of orthodoxy, he suddenly became the exponent of intellectual scepticism after the school of Montaigne. In politics he was a despiser of the commonalty, an opponent of popular freedom, and an upholder of royal prerogative.

Charrua, a large and warlike nation of South Brazil and Uruguay, formerly dominant between the Rio da Prata and the Mirim lagoon. They were gradually driven by the "Paulistas" (the enterprising white settlers in the province of St. Paul) from the open steppe country to the South Brazilian forests, where a few groups appear still to survive. The Charruas were specially noted for their extremely dark complexion, being described by early Portuguese writers as "black." They were very fierce and cruel, and displayed extraordinary skill in the use of the bow and sling.

Chart, a sea-map upon which are indicated not only the configuration of rocks and coasts, the

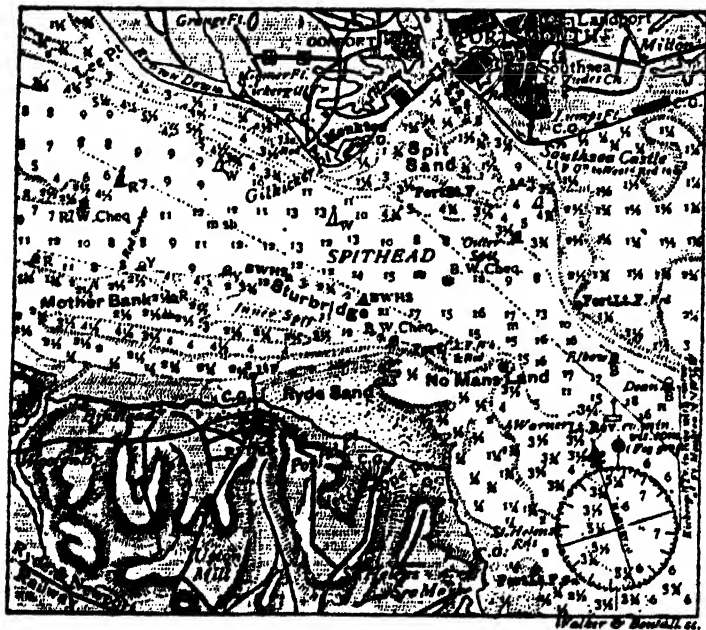


CHART.

nature and characteristics of marks, buoys, and lights, and the set of currents and tides, but the depth of water and the nature of the sea-bottom,

with any other particulars that may be of use to navigators. In British charts depths are marked in fathoms of six feet; distances are calculated in cables of one-tenth of a sea-mile. The meridian used is that of Greenwich. Russia, Germany, Sweden, Denmark, Norway, Holland, Austria, and the United States, also use the Greenwich meridian, but France uses that of Paris (which is long. 2° 20' 9.4" E. of Greenwich), and Spain, that of San Fernando, Cadiz (which is long. 6° 12' 16" W. of Greenwich). In foreign charts the depths, or low water soundings, are generally thus expressed:—

		English feet.	English fathoms.
DENMARK }	FAVN . . .	6'175 . . .	1.029
NORWAY }	VADEN . . .	5'575 . . .	0'929
HOLLAND . .	BRASSE . . .	5'329 . . .	0'888
FRANCE . . .	METRE . . .	3'281 . . .	0'547
GERMANY . .	FADEN . . .	5'906 . . .	0'984
PORTUGAL . .	BRACA . . .	6'004 . . .	1'000
RUSSIA . . .	SAJEN . . .	6'000 . . .	1'000
SPAIN . . .	BRAZA . . .	5'492 . . .	0'915
SWEDEN . . .	FAMN . . .	5'843 . . .	0'974

The quality of the bottom is usually expressed by some conventional contraction, *e.g.* r., rock; y., yellow; corl., coral. The invention of charts has been ascribed to John, King of Portugal. Very good English charts were prepared before 1580. The best of them are now constructed under the direction of the Hydrographic Department of the Admiralty, from actual surveys by naval officers and others. They are published by the Admiralty for the information of all who have occasion for them.

Charter. This word is from the Latin *charta*, and is of uncertain origin. The Greek form of the word is *chartes*, and it appears to have signified writing material made of papyrus. The term was afterwards applied, not only to the materials for writing, but to the writing itself, as to the letter or the leaf of a book. In English law it was supposed to denote any public instrument, deed, or writing, being written evidence of things done between man and man, and standing as a perpetual record. Among the Saxons such instruments were known as *genrite* or writings. At the present day it is best known as the document by which the express consent of the Crown is given. The term is more particularly applicable to the creation of corporations and other institutions, though it also applies to other exclusive rights granted to individuals or companies. As regards corporations the Crown's consent is presumed in the case of those existing by prescription, such as the City of London and many others which have existed as corporations time whereof the memory of man runneth not to the contrary, and therefore are regarded in law as well created. The consent of the Crown when express may be given either by Act of Parliament or by charter, the authority of Parliament, as regards the creation of corporations, having been usually exercised only in recognition of, or in aid of, but sometimes in regulation of the royal prerogative. Thus the Charter of the Royal College of Physicians (10th Henry VIII.) was confirmed by the statute 14

and 15 Henry VIII. c. 5. Again, the Corporation of the Bank of England was created by the Crown under the regulative provisions of an Act passed in the reign of William and Mary, and by an Act passed in the reign of William IV. (5 and 6 William IV. c. 76), it is enacted that upon the petition of the inhabitant householders of any borough in England or Wales, the king may by his charter incorporate such borough according to the provisions of that Act. But the power of Parliament has of late been most frequently invoked for the incorporation of public and other trading companies, though a simpler method of forming such companies is provided by the Limited Liability Acts (q.v.), and the Crown may still, and not unfrequently does, by its own charter or letters patent, erect a corporation. A charter of incorporation may be forfeited through negligence or abuse of its franchises. [CORPORATION, MAGNA CHARTA.]

Charterhouse (a corruption of Chartreuse), originally a Carthusian monastery in London, close to Smithfield, founded in 1371 on the site of a burying-field for those who had died of the plague. Confiscated at the dissolution of the monasteries in 1535, it became the family seat of the Dukes of Norfolk, and both Elizabeth and James I. stayed there; the latter on his first entry into London. In 1611 Thomas Sutton bought it and made it a school for boys, and an asylum for eighty poor gentlemen ("Brothers"). The school was removed to Godalming in 1872, and now ranks as one of the great public schools. The governors of the Merchant Taylors' School, a large London day school, purchased the site and transferred their school there. The buildings are mostly of the 17th and 18th centuries. The master's lodge contains valuable portraits. Addison, Steele, Wesley, Grote, and Thackeray were educated at the school, and it is familiar to readers of the latter.

Charter Party. An instrument in writing (with or without seal) which a party exporting goods from Great Britain or from any other place abroad, engages for the purpose, at a freight for. Upon the execution of the charter party the ship is said to be chartered, and the party by whom the charter is made is the charterer or freighter. The charter party is a contract taking the entire vessel or a part of it, and the charterer bargains for their cargo space in the particular vessel (other than a ship) at the same time conveyed in her, and the charter is described not as a charter of a ship, but as a charter of a ship, and in this sense the charter party is usually executed. The charter party is a contract between the master of the ship and the charterer, and the owner of the ship is not a party to it. The charter party is to be annexed to the bill of lading, and is in the charter party for a certain period of time, and the freight is so much per ton. The charter party is an instrument by which the ship-owner contracts with

necessaries, she shall receive a full cargo on board, not exceeding what she can reasonably carry, and that the same shall be properly stowed, and that the ship shall then immediately sail (wind and weather permitting) on the specified voyage and deliver the cargo (the act of God or of the king's enemies excepted) at the port of destination to the charterer or his assignees, in as good order as they were received on board, and on the part of the charterer that he will supply a full cargo, and load and unload the goods within a certain number of days (usually called lay or running days), and pay a freight as agreed upon, and that if he detains the vessel beyond the running days, he will also pay demurrage, that is a certain amount per diem for the whole period of such extraordinary detention. In the performance of this contract the ship-owner must take good care of the cargo during the voyage, and will be liable for any damage from the master's negligence or otherwise, or for loss or non-delivery of goods unless occasioned by causes within the exceptions of the charter party. If the ship-owner being prevented by an accident for which he is not responsible from entirely performing his contract, yet performs it in part by carrying the cargo safely during a certain portion of the voyage and the charterer receives the benefit of such performance, freight will then be due *pro rata itineris*.

Chartier, ALAIN (1380-1449), a distinguished French writer of the fourteenth century, born at Bayeux, and employed by Charles VI., whose court he followed, in the troublous times of Agincourt and the Maid of Orleans. His poetry was so admired by his contemporaries that young gentlemen and pages used to learn it by heart, and Margaret of Scotland, the wife of the Dauphin, is said to have kissed, as he lay asleep, the mouth from which issued such noble words. His best known work is *Le Livre des Quatre Dames*, said to have been called forth by the battle of Agincourt.

Chartism, in English history (1837-1848), though a political movement, arose mainly from economic causes. There was much distress and discontent among the labouring classes, due mainly to the existence of the Corn Laws, and stimulated by the necessary, but severe, new Poor Law of 1834. The troubles between capital and labour due to the "factory system" and the substitution of machinery for hand labour, and the severe laws against combination of workmen for trades-union purposes had also a large share in producing the feeling which found expression in the movement. The Reform Bill of 1832 had transferred political power from the landowners to the middle classes, but had practically ignored the artisans and labourers. On the accession of Queen Victoria in 1837 a petition was drawn up asking for a further extension of the franchise. Lord John Russell's ministry declining to reopen the Reform question, a conference between Liberal members of Parliament and working-class leaders drew up a programme of reform, comprising six points—universal suffrage, annual parliaments, the ballot, the abolition of the property qualification then requisite for

members of Parliament, equal electoral districts, and payment of members of Parliament. This programme was named the People's Charter by Daniel O'Connell. Prominent leaders of the movement were Feargus O'Connor, Ernest Jones, and Henry Vincent. In 1839 Vincent was imprisoned at Newport, Monmouthshire, and an attempt at rescue was made by 10,000 armed men, marching in three divisions, led by Frost, an ex-magistrate. Some misunderstanding among the leaders caused the attempt to fail, and Frost, Jones, and Williams were tried for high treason and sentenced to death, but the sentence was commuted to transportation. This trial, however, spread the movement, bringing in such men as Thomas Cooper, the poet (q.v.). In 1841 such Chartists as were electors helped to upset Lord Melbourne's administration by joining the Tories at the general election. In May, 1842, a monster petition was presented to the House of Commons, and it was moved that the petitioners should be heard at the bar by counsel, but the motion was opposed by Macaulay, Peel, and Roebuck, and rejected. The repeal of the Corn Laws partly allayed the agitation, which was revived in 1848 in sympathy with the revolutionary movements in France and on the Continent. A monster meeting was arranged for April 10th on Kennington Common (now Kennington Park) to march in military order to the House of Commons, and present a petition for legislation embodying the six points. The Government declared the meeting illegal, and troops (skilfully kept out of sight by the Duke of Wellington) were detailed to protect the various public buildings and break up the procession if necessary. Many of the more ardent Chartists favoured an armed resistance, but the night before the meeting, in deference to the advice of Feargus O'Connor and other leaders, the plan was abandoned, and the physical force men withdrew from the project altogether. Great alarm was felt in London, and 200,000 special constables were sworn in to preserve the peace. The petition was presented, and stated to be signed by 5,700,000 persons, but it was found, on examination, that the signatures numbered only about 2,000,000, and included a number of signatures, frequently repeated, purporting to be those of the Queen, Prince Albert, the Duke of Wellington, and various characters in the novels of Capt. Marryat and other popular literature. A subsequent demonstration on Whit Monday, May 12th, was a pitiful failure, and, though some riots took place in Lancashire, the movement gradually died out, killed by the failures of April 9th and 10th. See Justin McCarthy's *History of Our Own Times*.

Chartres, the Roman Autricum, capital of the Eure-et-Loire department in France, 55 miles S.W. of Paris, is on sloping ground overlooking the Eure, which divides into two channels, one inside, the other outside of the boulevards, which mark the former ramparts, and consists of an upper and a lower town united by steep streets. At the summit of the upper town is the eleventh century cathedral of Notre Dame, considered one of the finest in France, with its two lofty spires, its three rose

windows, and its many windows of thirteenth century glass. In the Marché aux Herbes an obelisk commemorates General Marceau. It produces wool and leather, and is noted for its corn-market, which is managed by women. The town gives the title of duke to the eldest son of the Orleans branch of the Bourbons.

Chartreuse, or LA GRANDE CHARTREUSE, in the Isère department, 14 miles from Grenoble, and 4,268 feet above the level of the sea, is the famous Carthusian monastery, founded by St. Bruno in 1084. The convent had formerly an extensive property, but this was confiscated by the State in 1793. The monks were allowed to return from exile in 1816. They were threatened with expulsion in 1880, and made preparations for it by transferring their library to a new monastery at Cowfold, in Sussex. In 1903 the monks were finally expelled, and the monastery ceased to be even a hostelry. Chartreuse is famous as being the original place of manufacture of the Chartreuse liqueur, which, green or yellow or white, is obtained from herbs.

Chase, SALMON PORTLAND (1808-1873), an American statesman and judge. Born in New Hampshire, he studied law, and in 1830 was called to the bar, making a great reputation in Ohio. He was a great opponent of slavery, and held that it was only an institution of individual states, and not one to be upheld by the National Government. In 1849 he became a member of the senate, and in 1855 was elected governor of Ohio, being re-elected two years after. In March, 1861, under President Lincoln, he became Secretary of the Treasury, a post which he retained till 1864, and showed great zeal and ability, though the wisdom of some of his financial measures has been greatly questioned. In 1864 he was appointed Chief Justice of the Supreme Court, and presided at the trial of President Johnson. He might have secured the Democratic nomination to the Presidency in 1868, but his views admitting the possibility of negro suffrage, he was rejected by the majority of the Convention.

Chasidim (Heb. *holy*), (1) a Jewish sect in the time of the Maccabees, noted for their austere observance of the letter of the law and of various rules deduced by them from it, like the Pharisees (q.v.), who, indeed, were a development of them. (2) In 1740 a sect of the name was founded in Podolia by a certain Israel Baal Shem ("Possessor of the Name," i.e. the Secret Name of God). Their creed is based on the Cabbala (q.v.), and is saturated with mysticism. At the death of their founder (1760) they split up into many congregations, each led by its own "Tsaddik" or saint, who is regarded as infallible, and who is supposed to work miracles, to have the power of protecting against disease, and to heal by his benediction. Their object is to obtain complete union with the Divine Essence, and their worship involves strange forms of religious excitement. They are said to be numerous in Poland, Roumania, Galicia, and Palestine.

Charles, MICHEL (1793-1880), a Frenchman of science, born at Chartres, and educated at the École Polytechnique, from which he passed as an officer of engineers, but resigned his place in favour of a comrade. He wrote upon mathematical subjects, and was in 1841 appointed to the chair of machines and geodesy in the École Polytechnique, and in 1846 to that of higher geometry at the Sorbonne. He wrote many works upon scientific points, especially geometry, and is considered one of the first geometers of the century. In 1867-1869 he defended the authenticity of certain letters (afterwards proved forgeries) of Pascal and Newton, transferring the credit of Newton's discoveries to Pascal. Their forger, one Irène Lucas, was convicted in 1869.

Charles, PHILARÈTE (1798-1873), a French writer born near Chartres. A follower of Rousseau from youth, he was imprisoned at the Restoration along with the Jacobin bookseller to whom he was apprenticed. Released from this imprisonment by the intervention of Chateaubriand, he was employed at a bookseller's shop in England, and studied deeply English literature, and so was able on his return to Paris to review English books in the *Revue Encyclopédique*. Two of his works were crowned by the Academy, and in 1841 he was appointed professor of northern languages in the Collège de France. Among other English subjects he wrote of Charles I., Mary Stuart, Cromwell, and Shakespeare.

Chassé, DAVID HENDRICK, Baron (1765-1849), a famous Dutch soldier, chiefly remembered, perhaps, for his defence of the citadel of Antwerp, with 5,000 men against 60,000 Belgians and French at the Belgian revolution in 1832. He began his military life at ten years old, and became a lieutenant-general in the French service in 1793. Napoleon used to call him General "Bayonet," owing to his fondness for employing that weapon. At the battle of Waterloo he did good service against the French as Lieutenant-General of the Dutch forces.

Chassepot, AN ALPHONSE, who was born in 1833, was at the small-arms factory at St. Étienne, where he improved his position by his successful efforts to develop a new needle-gun. His rifle was afterwards superseded by the French rifle, which was 8 lb. 14 oz. 13 grains in weight of its cartridge, and of its bullet, 370 grains, and was loaded with four grooves.

Chassepot is a name of light arms in the French army. The Chassepot rifle was adopted by the Prussians in 1874, and in 1877 it was like them. In 1877 the Chassepot rifle was used by the Prussians in the Franco-Prussian war.

were organised. During the wars of the Revolution and the First Empire the number varied from 12 to 31 regiments. The Chasseurs d'Afrique (mounted) were raised in 1831 for service in Algeria. At present (1909) there are 21 regiments of mounted chasseurs in the French service, and six of Chasseurs d'Afrique. There are 30 battalions of chasseurs-à-pied, each of four or six companies. A company consists of 19 officers and 552 men.

Chasuble (Lat. *casula*, a little cottage, because, according to St. Isidore of Seville, it covers the whole person), originally the outer garment of the poorer classes, clergy and laity alike, under the later Roman Empire. Gradually, however, its use became confined to the clergy, and its shape much modified. Originally a sleeveless circular cloak, with an opening for the head, and (we are told) a hood, it has become oval in the Roman Church, and is often elaborately decorated. In the Roman Church it is reserved for the officiating priest at the mass. In the Anglican Church it is often worn by the High Church clergy when celebrating Holy Communion. The Eastern Church also has it.

Chat, any bird of the genus *Saxicola* of the thrush family, with 36 species from Africa, the north-west of India, and the whole Palearctic region, migrating to Alaska and Greenland. The beak is straight and slender, and surrounded with a few bristles. [STONECHAT, WHEATEAR.] The Yellow-breasted Chat of the United States is *Icteria virens*, one of the hang-nests (q.v.).

Chata (*Pterocles alchata*), a species of Sand-grouse (q.v.).

Chateaubriand, FRANÇOIS RENÉ, Vicomte de (1768-1848), a French writer and politician—the father of the French Romantic school—was born at St. Malo, and spent his early youth among the romantic surroundings of Brittany. In 1790 he departed for America with a view to finding the North-West Passage, and spent eight months there, the events of which he recorded in his *Voyage en Amérique*. He returned about the time of Louis XVI's execution, and went with the other émigrés to England, where he lived for some years, maintaining himself by literary labour, studying at the same time English literature, and maturing his prose epic of the Red Indian race, *The Natchez*. In 1797 he published an *Essai sur les Révolutions*, and having returned to France in 1800 he published in the next year *Atala*. This, which is similar in style and effect to *Paul and Virginia*, made a great sensation, and established its author's reputation by its style and eloquence, which marked a new departure in French literature. In 1802 he published his *Génie du Christianisme*, which displays more eloquence than argument, and pleased Napoleon, who was just then restoring the Catholic religion in France. He appointed Chateaubriand to a diplomatic post, which the latter resigned upon the murder of the Duc d'Enghien. *René*, which is thought to reveal the state of Chateaubriand's own heart, had already appeared before

Les Natchez was published in 1826, which year saw also the publication of the *Last of the Abenerrages*. As a politician, Chateaubriand had published in 1814 a pamphlet *Bonaparte et les Bourbons*, a work which Louis XVIII. said stood him in the stead of 100,000 men, and in gratitude the king made much of him. He, however, was in the Liberal Opposition, and on a change of government was successively ambassador to England, representative at the Congress of Verona, and ambassador to Rome. On the accession of Louis Philippe he refused allegiance, and his political life was practically ended. His posthumous *Mémoires d'outre Tombe* probably occupied most of the time of his retirement. He is buried, by his own desire, on a rocky islet off St. Malo.

Châteauroux, a French town, capital of the Indre department, on the left bank of the Indre, 90 miles S.W. of Orleans. Its principal manufacture is that of woollen goods, and there is a trade in leather, iron, cattle, and lithographic stone which is quarried in the neighbourhood.

Châtelet-Lomont, MARQUISE DU (1706-1749), a learned Parisian lady, who, to a knowledge of Latin and Italian, mathematics, and physical science, added great wit and beauty. She is said to have been successively the mistress of Voltaire (who lived with her at one of her husband's chateaux for several years), and of a Captain of French Guards. She wrote *Institutions de Physique* and made a French translation of Newton's *Principia*.

Châtelleraut, a French town in the Vienne department, on the second bank of the Vienne, over which a stone bridge leads to the suburb of Châteauneuf. It stands in a fertile valley, and is 24 miles N. of Poitiers, and 80 miles S. of Tours. It is a principal seat of the French cutlery trade, and there is a Government sword and bayonet factory, and the town has a considerable trade. The title of Duke of Châtelleraut is claimed by the Duke of Hamilton and the Duke of Abercorn, as descended by the female side from the original James Hamilton Earl of Arran, to whom it was granted in 1548. A decree of Napoleon III. confirmed the title to the former.

Chatham, in Kent, is situate upon the south side of the Medway, about 15 miles from its junction with the Thames, and 27 miles east of London, and forms one continuous town with Rochester. The town itself is neither interesting nor beautiful, as Dickens points out in his *David Copperfield*, but it is of great importance as a military and naval station. Chatham is the headquarters of the Thames military district, and has a number of military establishments included within the famous "lines"; these works are, however, now obsolete, and have been replaced by a chain of detached forts, constructed on modern principles at considerable distances from the town. Outside is an extensive tract used for military manœuvres. There are several military barracks and a naval barracks, costing about £500,000, was completed in 1903. Prior to 1893 Chatham was one of the chief con-

vict stations, and many of the military works and docks were built by convicts. Among the public buildings is the town hall, in English Renaissance style, opened in 1900. There is a great naval dockyard at Chatham which is nearly two miles long, and has lately been extended in other directions. Chatham was of little importance till Elizabeth established the dockyard, and built Upnor Castle upon the other side of the river to defend it. It sends one member to Parliament. There are several brickyards, limekilns, and flour mills in the neighbourhood, and the presence of the garrison and dockyard men gives plenty of trade to the town. Traces of Roman villas and other Roman remains have been found, and in the church of St. Mary there is a monumental brass to Stephen Brough, discoverer of the northern passage to Russia. In 1667 De Ruyter sailed up the Medway and set fire to the shipping at Chatham. (Pop. 1901, 40,753.)

Chatham, WILLIAM PITT, EARL OF (1708-1778), a great English statesman and orator, was born at Westminster, and educated at Eton and at Trinity College, Oxford, where his favourite author was Demosthenes, and whom he translated and retranslated to attain to facility of expression. At his father's death in 1727 he entered the army as cornet. In 1734 he entered Parliament as the member for Old Sarum, and soon became a prominent member of the Whig opposition to Walpole's government, and became so annoying a critic that Walpole punished him by procuring his dismissal from the army; but being appointed groom of the chamber to the Prince of Wales, Pitt continued to harass Walpole, and was one of the chief instruments in bringing about his downfall in 1742. The king, who resented the terms in which Pitt had spoken in debate of the House of Hanover, was opposed to his entry into the ministry, and it was not until 1746 that he was admitted into the Pelham ministry as first vice-treasurer of Ireland, and then as Paymaster-General—a post which gave him a seat at the Privy Council—and which, by giving him the occasion of displaying at that time unusual integrity, led to the confidence afterwards reposed in him by the nation.

In 1754, though still in office, he attacked his own Government, and was constrained to resign. But in 1756 Pitt was again in office as Secretary of State and leader of the Commons, under the Premiership of the Duke of Devonshire. In 1757 he was again out of office, but so strong was the confidence expressed by the public at large in the "Great Commoner," that he was soon back as virtual, though not nominal, Prime Minister. This was the celebrated four years during which Pitt's life has been called the history of England. It was he that chose General Wolfe, and so brought about the taking of Quebec; his encouragement of Clive led to the founding of our Indian Empire; and by his aid Frederick the Great ended the Seven Years' war. With the accession of George III. and the advent of Lord Bute to office arose difficulties, especially that of the Bourbon League, which led to Pitt's retirement, and he accepted a pension of £3,000 a year, and a peerage for his wife.

In 1766 he supported the bill for repealing the American Stamp Act, and in the autumn of that year he was entrusted by the king with the formation of a ministry. With its formation he went to the Upper House as Viscount Pitt and Earl of Chatham—a step which cost him much in popularity. At this point of his career, just when a most critical juncture had arisen, especially with regard to the American question, a mysterious illness utterly incapacitated him for business, and the Ministry were virtually without a head. He remained in retirement, and in 1768 he resigned on the ground of ill-health. In 1770 he appeared again in the House of Lords as the opponent of the Government on their American policy; and in 1778 he spoke for the last time against concluding a peace. The famous historical picture has made everyone acquainted with the details of this scene, and how the stricken peer was removed from the House to die the next month at Hayes. The great defect in Chatham's political career seems to have been the inconsistency with which he changed his opinions when the change brought power. In this he is not without later imitators.

Chatham Islands, so called from the name of the ship *Chatham*, commanded by Lieutenant Broughton, who discovered them in 1791, are a group of islands in the Pacific, 560 miles E. of New Zealand, to which they belong. The group consists of three islands and some rocky islets. Chatham Island, the largest of the group, contains over 305,000 acres, and has in it a large lake twenty-five miles long, and six or seven broad, which sometimes bursts through a separating sand-bank and communicates with the sea. The island is fertile, and produces much flax, and the climate is mild. The vegetation generally resembles that of New Zealand, but the trees are much smaller. Many horses and cattle are bred for the New Zealand market.

Chati (*Felis mitis*), an American cat, ranging from Mexico to Paraguay. It is probably a variety of the Marsh Cat.

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Chas. on the Ed. building, quailed, appeared 17th Jan.

There is a fine library, and some beautiful wood carvings, paintings of the old masters, and sculptures. The park and gardens are ten miles round, the latter covering twelve acres, and having a grand conservatory, erected by Sir Joseph Paxton, of an acre, and the waterworks almost rival those of Versailles. The present building was begun in 1688 by the first Duke of Devonshire, and finished in 1840 by the seventh duke.

Chattanooga, the capital of Hamilton county, Tennessee, in the United States, is on the left bank of the Tennessee, which is navigable during eight months of the year. There is also good railway accommodation, and there is much trade in coal, iron-ore, and timber, produced in the district. Saw-mills and wood-work factories are the chief industries. General Grant here defeated the Confederates in 1862 and 1863.

Chattel (Lat. *capitale*, the same word as capital and cattle), properly a single head of cattle, or a single article of movable property ; in English law the term strictly includes all property which is not freehold. Interests on lands, buildings, etc., are classed as chattels real, while articles of personal property are classed as chattels personal. The rules of succession in respect of these two classes of property differ considerably. [REAL PROPERTY, PERSONALTY.]

Chatterer, the popular name of birds of the family *Ampelidae*, with four genera and nine species, characteristic of the Nearctic and Palearctic regions, but ranging to Costa Rica and the West Indian Islands. [CEDAR-BIRD, WAXWING.]

Chatterton, THOMAS, poet, was born in 1752 at Bristol, a few months after his father's death. After attending Colston's Bluecoat school, he went as apprentice to an attorney at the age of fourteen. After hoaxing his usher, and making five shillings out of a made-up pedigree, he hoaxed the whole of Bristol in 1768 with a description of the opening of Bristol old bridge "from an old manuscript" which he professed to have found in St. Mary Redcliffe church, Bristol. In 1769 he approached Sir Horace Walpole, sending him a copy of *The Ryse of Peyncetynge, written by T. Rowlie, 1469, for Master Canynge*. Walpole, who was then engaged upon his *Anecdotes of Painters*, was charmed with this, and nearly committed himself. Losing his situation, Chatterton, in 1770, removed to London, and was well received amongst the publishers. His prospects at first were fair, and he worked hard with his pen. At length, however, his means began to give way, and on August 24th, 1770, losing hope, penniless and hungry, he shut himself in his room, destroyed his papers, and took arsenic. He was found dead next morning, and was buried in the pauper's pit attached to the city workhouse, Shoe Lane. His chief poetical productions are those that were published under the pseudonym of Rowley, and written while he was still at Bristol, and therefore but a boy. They include *Elinoure and Juga*, written while he was at Colston's school, *Bristowe Tragedy*, *Ellia*, a *Tragycal Interlude*, *The Battle of Hastings*, etc. These are among his spurious

antiques. His modern poems are of singular beauty, and place him alongside of Keats in English literature.

Chaucer, GEOFFREY, was born in the year 1340, probably at London, but his birthplace is not authenticated. His father, John Chaucer, was a citizen and vintner of London, and seems to have had some link of service with the royal household. We first hear of Geoffrey Chaucer in the year 1357, when he received a suit of livery as member of the household of Prince Lionel (son of Edward III.) or of his wife Elizabeth de Burgh. We know, from his own words, that he served as a soldier in his youth, and it is likely that he was with the English army in France in the autumn of 1359, when the imprisonment took place to which he himself refers. It cannot be determined whether he studied at any of the Universities, but he had been, at any rate, an acute and industrious student. He undoubtedly possessed a wide acquaintance with the general intellectual acquirements of the age in which he lived; he knew the classics, divinity, astronomy, and all that was then discovered about chemistry. We get the next definite light on Chaucer's career from an entry in the Issue Rolls of 1367, where reference is almost certainly made to him as one of the "valets of the king's chamber." At this time also the poet appears to have had that love affair, the result of which was the rejection of his suit, and then the composition of his first original poem, the *Compleynyte to Pite* (pity). In 1369, on the death of Blanche, the wife of John of Gaunt, the friend of Chaucer, he composed his memorial poem, *The Death of Blanche the Duchesse*. In 1370 Chaucer entered on the diplomatic engagements which seem to have been entrusted to him from time to time. During this year he was abroad in the king's service. In 1372 he formed one of a commission, with some citizens of Genoa, to arrange as to an English port which might be used for Genoese commercial purposes. He remained in Italy about a year, during which time he also visited Florence. It is possible, though not certain, that he now met Petrarch. Shortly after his return to England he received the distinction from the king of a daily grant of a pitcher of wine, changed in 1378 to a yearly payment of 20 marks. In the same year he was appointed controller of the customs and subsidy of wools, skins, and leather, in the port of London; and he was further enriched now by the receipt of a pension from the Duke of Lancaster. His Italian journey, and the consequent study of Italian literature, had a marked influence on the poet's work. His *Troilus and Creseide*, among others, indicates this. In 1377 Chaucer accompanied Sir Thomas Percy on a secret mission to Flanders, and it is supposed that he was also somewhat later in the year one of those sent to treat in regard to peace with Charles V. of France. On the accession of Richard II. in 1378 he was again appointed one of the royal esquires. He may have made two official journeys in the course of this year—one to France to discuss the marriage of Richard with the French king's

daughter; the other to Lombardy, on a matter relating to the peace of England. Not only did Chaucer as formerly accomplish his missions successfully, but a marriage-poem, which he composed in honour of the young queen, enhanced his esteem at Court. In 1382 he was re-appointed to his former office as controller, but this time by deputy. In 1386 he was elected member of Parliament for Westminster. Chaucer's prosperity was now at its height. From this period dates the composition of his *Canterbury Tales*. Now, also, he wrote his *Legende of Good Women*. This season of good fortune, besides being productive of some of his best work in verse, also introduced him to several congenial friendships. There were now associated with him on intimate terms Gower, Lydgate, Occleve, and other men of note. A change in the lot of the poet, however, soon took place. Just when the ripest and best of his poetical work was being produced in the *Canterbury Tales*, he was met by business reverses. In place of his friend, John of Gaunt, Duke of Lancaster, Thomas, Duke of Gloucester, had become the favourite of the young king; reforms and alterations took place under his management, and among these was the entire loss to Chaucer of his controllerships. There can be no doubt that the disaster arose not through his own fault, but from the fact that he was an adherent of the Lancaster party. Following this loss came others. His pensions had had to be mortgaged, and were finally paid over to creditors. It is characteristic of the robust nature of the man that he still kept a good front to his difficulties, and it may well be that his noble *Balade of Truth* ("Flee fro' the press") was written at this time. His misfortunes were crowned by the death of his wife in 1387. A change for the better in Chaucer's affairs came, in 1389, by the restoration of the Lancaster party to office. The poet was appointed clerk of the king's works at Westminster, at a salary equal to about £1 a-day of our money. This income, if it did not last long, was for the time helpful. In 1391 he wrote his treatise on the *Astrolabe*; most likely his *Stedfastness* and other shorter pieces were composed between this date and the year 1399. In 1394 Chaucer received a pension from the king of £20 a-year for life, but he does not appear to have been in very comfortable circumstances about this date. Four years later a still further mark of the king's goodwill was shown towards him by the grant of letters of protection against arrest. A distinct revival in the poet's prosperity ensued with the accession of the young king, Henry IV., son of the Duke of Lancaster. His pension was doubled, and he had a humorous fling at his poverty in his address *To his Purse*. Towards the close of 1399 Chaucer went to occupy a house he had leased in the garden of the Chapel of St. Mary, Westminster. There he died after a brief stay, October 25, 1400.

From the year 1868, when the Chaucer Society was founded, much has been done both in England and Germany to throw light on the life and work of the poet. In regard to his biography, not a little fresh knowledge has been obtained by researches in the Patent and Issue Rolls, while the

Chautauque lake, near New York State, in an interesting previous, 'summer' started by and played Vincent. Theatre, the

Chavantes, a warlike and predatory Brazilian people, formerly dominant along both banks of the Tocantins, known to the early Portuguese explorers as *Canociros* from their great skill in navigating their canoes. Their arms were a very long spear, the bow and arrow, and a massive club ; but some of the tribes having been converted by the Jesuits learnt the use of firearms, and afterwards escaping to the woods became very formidable to the white settlers in Goyaz and Maranhão during the first quarter of the nineteenth century. But they were weakened by intertribal wars with their southern neighbours, the equally fierce Acroas and Payaguas. Some are now settled and have become peaceful cultivators and traders about the confluence of the Tocantins and Manoel-Alves-Grande.

Chazars, or KHAZARS, a Scythic, or, more probably, Finnish people of Eastern Europe, by Byzantine writers connected with the Turks. Settled originally on the north of the Caspian Sea, they made frequent raids into Persia in the sixth century, while on the fall of the Sassanide dynasty (q.v.) they acquired part of Armenia, and also the Crimea. Astrakhan on the Volga was long their capital. From the middle of the tenth century their power waned before the growing strength of the Grand Dukes of Russia. In the eleventh century they lost the Crimea, then called Khazaria, and thenceforward disappear from history. The Caspian Sea has sometimes been called Khazarian after them.

Cheating is the fraudulently obtaining the property of another by any deceitful practice not amounting to felony, but of such a nature that it directly affects or may affect the public at large; numerous statutes have been passed to restrain cheating in particular businesses. Moreover, the offence of selling articles, knowing any trade-marks thereon to be counterfeited, is reducible to this head of cheating, as is also the offence of selling by false weights and measures. The general punishment for all cheating indictable at common law is fine and imprisonment, to which by a statute passed in the fifteenth year of the reign of Queen Victoria (chap. 29), hard labour may now be added. Cheating at play is punishable in like manner, as obtaining money by false pretences, under Vict. 8 and 9, chap. 109.

Chechenz, one of the chief divisions of the Daghestani aborigines, East Caucasus, along the right bank of the Terek, thence south to Vladikavkaz, and nearly to Mount Kazbek; Chechenz is the Russian, Kist the Georgian, and Nakhtchuoi the national name. Chief branches: Ingush, Karabulak, Chechenz proper, and Tûsh; speech extremely rude, and quite distinct from Lesghian and all other Daghestan idioms; square figures, aquiline nose, swarthy complexion, scanty black beard. The Chechenzes offered a most determined resistance to the Russians, and were not finally reduced till the death of their famous leader, Shamyl (Samuel), in 1859. Like the Circassians, most of them had then to abandon their highland homes, or else to migrate to Turkish Armenia, where fresh disasters overtook them. Nearly all are Mohammedans of the Sunni sect.

Cheddar Cliffs, which might rather be called a pass or gorge, a narrow winding fissure in the carboniferous limestone of the Mendip Hills, near Cheddar, in Somersetshire. The fissure, no doubt, originated along a line of fracture, and has a general N.E. and S.W. direction, the beds of limestone dipping across it S. or S.E., from 19° to 24° on one side and from 15° to 23° on the other. The solvent action of carbonated water, frost, and streams running underground, have widened the ravine, most of the material being removed from the north-west or dip-slope side. A road now runs along the bottom of the pass. There are numerous caverns and swallow-holes in the district, and the

former by collapse of their roofs may give rise to ravines.

Cheduba, an island of India, is situated in the Bay of Bengal. Its area is about 250 square miles, the soil yields good crops of rice, tobacco, and cotton. Petroleum is also found on the island.

Cheefoo, a treaty-port of China, is situated on the N. side of the Shan-Toong promontory. It is a place of considerable importance from a commercial point of view, its imports being worth nearly £2,000,000 yearly.

Cheese consists of the casein of milk, together with the greater portion of the fats, and small quantities of mineral matter. It is manufactured by causing the coagulation of the casein by adding "rennet" to the milk. The rennet is prepared by treating the stomach of a calf with a strong solution of common salt. When added to the milk the casein coagulates and carries down with it most of the fat. When the precipitation is complete, which is generally the case in about an hour, the coagulated mass, the *curd*, is broken up, and the clear liquor, the *whey*, poured off. The curd is allowed to stand for about an hour, and is then collected and pressed. It is broken up, salted, and again moulded and pressed. It is finally dried in the "*curing*" room at a temperature of about 75°. For the production of the cheese, either the whole milk or skim milk may be used. In the case of cream cheeses, cream is added to the milk. The different varieties of cheese, as Cheddar, Stilton, Gruyère, etc., all possess nearly the same composition, the variations in flavour, etc., being due to slight differences in the details of preparation.

Cheetah (*Felis jubata*), the hunting leopard, sometimes made the type of a distinct genus with the name *Cynalurus jubata*, ranging through Central Asia westward, and into Africa southward to near the Cape. It is about 54 inches long, exclusive of the tail, which is from 30 inches to 33 inches more. The colour is light rufous fawn spotted with black, and the tail is more or less ringed with black. There is a kind of mane on the neck, and the hair on the belly is long and light-coloured. The head is short and rounded, as are the ears, and the limbs are long and slender. The claws differ from those of other cats in not being completely retractile, though the ligaments which should serve to draw them back are present. The upper sectorial tooth has the inner cusp quite rudimentary. The Woolly Cheetah (*F. lanæ*), from Cape Colony, described by Mr. Sclater, may be only a variety. The Cheetah is partially domesticated, and is employed in the chase.

Cheilostomata, one of the three divisions of the Bryozoa belonging to the sub-class ECTOPROCTA. The main features of the order are these:—It has a calcareous or chitinous skeleton; the openings of the individual animals (zoecia) that build up the colonies are lateral instead of terminal; the modified zoecia, known as avicularia and vibracula, are here most developed; "oecia" or marsupial pouches are present.

Cheiroptera. [BAT.]

[illegible]

Chelmsford (Herts.) is a town in the south-east of England, 15 miles (24 km) north of London. It is a major centre for the textile and engineering industries. The town is situated on the River Chelmer, which flows into the North Sea. The town is a member of the Greater London Council (GLC) and is part of the London Borough of Havering. The town is a major centre for the textile and engineering industries. The town is situated on the River Chelmer, which flows into the North Sea. The town is a member of the Greater London Council (GLC) and is part of the London Borough of Havering.

Cheltenham, a town of England, in the county of Gloucester, is a watering-place of fashion, and stands on the Chelt, a tributary of the Severn. Beautifully situated in a valley, it was only a small village, when in 1716 mineral streams were discovered, which led to its rapid growth. Its waters are reputed good for liver ailments and dyspepsia. It has fine squares, gardens, pump-rooms, and places of amusement. It is also

distinguished as an educational centre, having besides private schools the large proprietary college, grammar school, ladies' college, and training college for teachers. Its parish church is of the fourteenth century, and among its other buildings the most notable are the Roman Catholic chapel, with a spire over 200 ft. high, the public library, and the corn exchange. It is a municipal and parliamentary borough, returning one member to Parliament. Pop. (1901), 49,439.

Chelyuskin, CAPE, is the extreme north of Asia, and is on a peninsula of the same name. It is named from a Russian officer, who died here in 1742.

Chemistry may be defined as the science which treats of the composition of substances, and the changes produced in them by physical forces or by interaction with other substances.

The determination of the composition of substances or their *analysis* involves (1) a *qualitative analysis*, or the determination of the elements present, and (2) the *quantitative analysis*, a determination of the relative proportions of the respective components. These two together constitute the department of *analytical chemistry*. The ascertainment of the relative quantities of the elements present in a body is not, however, sufficient for the complete knowledge of its composition. The absolute number of the atoms present, and their arrangement in the molecule—*constitution*—must also be determined. This is frequently only possible by a careful and arduous study of the physical properties of the substance, and the effects of its interaction with other compounds.

By the term "changes," as employed in chemistry, is understood chemical changes, *i.e.* alterations in the chemical nature or composition of the substance; in contradistinction to physical changes which only affect the state of the body, the composition remaining unaltered. Thus by the action of heat water becomes converted into steam, but this involves no alteration in the composition, as steam and water are identical in this respect, and on cooling water is again formed. If an electric current, however, be passed through it, water is decomposed, and a mixture of two gases is obtained which do not on cooling recombine.

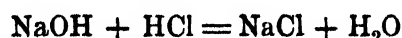
The science of chemistry touches the other sciences at very many points, and has very many different ramifications. All the processes by which metals are reduced from their ores, and all the methods of assaying them, are essentially chemical processes; they are, however, numerous enough to make the basis of the separate science of *metallurgy*. So too the deposition of metals from solutions which contain them by means of an electric current is a chemical process called *electrolysis*, and this action is the basis of electroplating and similar practical arts. In the same way the changes produced by the air or water on metals, rocks, etc.—changes like rusting, tarnishing, weathering—are essentially chemical changes. The determination of the constituents of minerals is similarly only possible by means of chemical

knowledge. Among other arts which can only be comprehended through the study of chemistry are those of glass manufacture; coal-gas manufacture; the manufacture of acids, alkalis, soda, soap, dyes, etc.; such processes as bleaching, and very many others. The science is also inseparably linked with the phenomena of life. *Bio-chemistry* has to deal with the many changes that take place during the assimilation of food, during the activities of the various organs and tissues, and during the life of the protoplasm of the living cell itself. The work of the body-fluids—blood, lymph, etc.—involves deep-seated chemical operations of the highest importance and subtlety. The analysis of foods and the composition of drugs comes also within the scope of the science. In the realm of plants chemistry has to study the influence of air, water, soil, manures, etc., upon the living plant, and the processes by which the plant-substance is formed from these materials. Hundreds of substances are obtained from the living animal or plant; thousands of derivatives have been prepared from them; and the chemistry of these substances is generally spoken of as *organic chemistry*. But there is no essential difference between organic and inorganic substances: many of the former have been synthesized from purely non-living matter. The department of organic chemistry now means the study of the compounds of carbon, which is the element almost always present in organic substances.

A chemical change is distinguished from a physical change, as we have explained; but a series of phenomena lie close to the border line of this distinction, and constitute a distinct branch of chemistry called *physical chemistry*. Such phenomena as those of solution, osmosis, etc., come into this category; it is very difficult to say offhand whether the dissolving of salt in water, for instance, is a chemical or merely physical change. Akin to this branch of chemistry also is the study of the rate at which chemical changes take place, called *chemical dynamics*. All chemical changes also are attended by the absorption or production of heat or other forms of energy; thus, phosphorus combines with iodine violently enough to produce both heat and light; and, on the other hand, both heat and light are needed to enable a living green plant to manufacture its starch. The heat liberated in chemical changes is made use of in all processes of combustion, which is a particular form of chemical change.

To represent the composition of bodies and the changes they undergo in different reactions, in a concise and simple fashion, chemists adopt a system of chemical nomenclature. That in use at the present time may be briefly described. Each element is represented by a *symbol*, which is generally the first letter, or characteristic letters, of its name, or in the case of the commoner and longer known elements, its Latin name. Thus oxygen is represented by the symbol O, silver by the symbol Ag. (Argentum). This symbol is used not only to represent the element qualitatively but also quantitatively, being used to signify a weight of the element proportional to its atomic weight. [ATOMIC THEORY.] By the combination of symbols *formulæ*

are obtained representing compound substances, the number of such proportional weights being indicated by a small numeral placed at the right of and below each symbol. Further, each formula is taken to represent the molecule of the substance. Thus, NH_3 stands for one molecule of ammonia gas, weighing 17, and consisting of one atom of nitrogen and three atoms of hydrogen, i.e. 14 parts by weight of nitrogen combined with 3 parts of hydrogen. With these formulæ chemical changes are represented by *equations*, in which the formulæ of the reacting substances separated by the sign + are placed on the left side, and the formulæ of the resulting products on the right side, the two sides being joined by the sign of equality =. It is evidently a quantitative as well as a qualitative relation. Thus the equation



states that by the interaction of 40 parts (by weight) of caustic soda and 36.5 parts of hydrochloric acid, there result as products 58.5 parts of sodium chloride and 18 parts of water. The law of the *indestructibility of matter* serves as the basis of all chemical equations: that is to say, the equation must not represent the creation of new matter or the destruction of an atom of the whole. As above, the two atoms of hydrogen in the water have come—one from the caustic soda molecule, the other from the hydrochloric acid. Frequently two different substances may possess the same percentage composition and same number of atoms [ISOMERISM]: on this account formulæ are frequently employed which endeavour to represent the arrangement of the atoms. These are known as *constitutional formulæ*, and are of more frequent use in organic chemistry. The difference is seen in the formulæ of two isomeric substances, such as ethyl alcohol and dimethyl ether, both represented by $\text{C}_2\text{H}_6\text{O}$, but distinguished by $\text{CO} \begin{cases} \text{NH}_2, \text{ amm} \\ \text{NH}_2, \text{ amm} \end{cases}$ although both of the same composition are represented by the same formulæ. Different arrangements of the atoms in a molecule exist in their very different.

The word chemistry is derived from the Greek *chēmeia*, the original meaning of which is doubtful. It is derived from the Egyptian word *chem*, which means to burn, in such a case the meaning of the word is the Egyptian art of burning. The Egyptians, Greeks, and Romans possessed a knowledge of various chemical processes, but their technical knowledge was not correlated. It was not until the middle ages that any real progress was made, however, and it was not until the time of Aristotle, which was the beginning of the belief in alchemy, that the exertions of philosophers and chemists began until the

early part of the sixteenth century the application of chemistry to medicine received an impetus through the work of Paracelsus (and afterwards of Van Helmont), who endeavoured to fuse medicine and chemistry into one branch of study. With Boyle begins the era of exact experimenting and of researches into the composition of substances. He, amongst other work, first clearly defined the meaning of the term *element*, and brought forward the law which bears his name. Contemporaneous was Mayow, and shortly afterwards Lemery advanced the science and first drew the distinction, now meaningless, between organic and inorganic chemistry. Becher and Stahl (1660–1734) promoted the further development, the latter advancing the theory of combustion known as the *Phlogiston Theory* [PHLOGISTON], which was for the next century generally accepted by scientists. The latter portion of the eighteenth century stands out as an epoch of brilliant chemical discoveries, chiefly through the exertions of Black, Priestley, Scheele, Lavoisier, and Cavendish. The latter first discovered the composition of water, and demonstrated the balance as the instrument *par excellence* of the chemist. Priestley, amongst much other work, discovered oxygen (1774), simultaneously found by Scheele, who added chlorine and manganese to the list of known elements. With Lavoisier dawns a new era in the history. His great work was the overthrow of the Phlogiston theory and establishment of the present theory of combustion and oxidation. The next great step was the enunciation of the Atomic theory by Dalton (1803), which was further developed by the labours of Davy, Gay-Lussac, and Berzelius. The former, also, is illustrious as the discoverer of the metals of the alkalis and the alkaline earths. Gay-Lussac originated the law associated with his name, and Berzelius first determined the atomic weights of a large number of the known elements. Avogadro (1811) brought forward "Avogadro's law," and about 1820 Dulong and Petit discovered the law connecting specific heat and atomic weight; and Mitscherlich enunciated the law of "Isomorphism" (q.v.). About 1861 the application of the spectroscope to chemical analysis by Bunsen and Kirchhoff opened up an entirely new, wide, and fruitful field of investigation. From this time on the number of workers is legion. The discovery of the Periodic Law (q.v.) by Newlands (1864) and its further development by Lothar Meyer and Mendeleef was a most fruitful step in advance.

In more recent times great progress has been especially made in physical chemistry; Ramsay's discovery of argon and other unsuspected gases in the atmosphere, the liquefaction of the so-called "permanent" gases, and the evidence of transmutation among the elements afforded by radium and its congeners, are perhaps the most notable accomplishments of recent years.

Organic chemistry has also made rapid advance since Wohler, in 1828, made urea from inorganic sources, and thus, for the first time, bridged the gap between organic and inorganic substances. The preparation of new carbon-compounds is almost

a daily occurrence. The great dye industry, started by Perkin when in 1856 he prepared the first aniline dye, is a practical fruit of this branch of the science: the commercial production of artificial indigo is now a commonplace.

Chemists are also occupied with attempts to understand the constitution of the more complex substances which occur in the animal and vegetable kingdom. The constitution of such substances as uric acid, the fats, and the sugars is now understood; alkaloids like morphine are more difficult, but are yielding to modern methods; only the proteids (*e.g.* albumin) remain too complex for chemists to hope for their synthesis at present.

Chemists, LAW RESPECTING. No person may assume the title of a chemist or druggist, or sell by retail (or compound) the poisons specified in certain statutes of Queen Victoria's reign, unless he has been examined and has obtained a certificate and been placed on the register of the Pharmaceutical Society of Great Britain. Chemists and druggists are not, however, subject to the espionage and fines for offences inflicted by the Apothecaries Act with reference to the buying, preparing compounds, dispensing and vending of drugs, medicines, and medicinale compounds wholesale and retail. *See* the statutes 55 George III., c. 194, sec. 28; 15 and 16 Vict., c. 56; 31 and 32 Vict., c. 121; and 32 and 33 Vict., c. 117.

Chemnitz, a town of Saxony, situated on a river of the same name at the foot of the Erzgebirge. It is the centre of the cotton-weaving industry in the kingdom, and is known as the "Saxon Manchester." It has also manufactures of woollens, silks, and other textile fabrics, as well as factories for making machinery.

Chemnitz, MARTIN, theologian, was born in 1522 at Treuenbrietzen, Brandenburg. He was very poor, and while a student had to leave his studies to work for food. At length, in 1550, he received the appointment of librarian to Duke Albert of Prussia at Königsberg. In 1553 he had to leave in consequence of his antagonism to Osiander, and went to Wittenberg. Here he lectured on the *Loci Communes* of Melancthon, the lectures being published under the title of *Loci Theologi* after his death. He then repaired to Brunswick, where he laboured as a preacher, and died in 1586. Among his works are *Examen Consilii Tridentini*, and *Corpus Doctrinae Pruthenicum*, the joint work of Chemnitz and Morlin, and subsequently the standard theological work of orthodox Lutheranism.

Chemosh, the national god of the Moabites, who are hence (Numbers xxi. 29, Jeremiah xlviii. 46) called "the people of Chemosh." Solomon even "built an high place for Chemosh, the abomination of Moab, in the hill that is before Jerusalem."

Chemulpo, a town of Corea on the west coast, is one of the three treaty-ports of Corea. Though its harbour accommodation is not good, its trade has continued to increase since it was opened up to foreign commerce in 1883. It imports

European and American manufactures, and among its exports are beans, ginseng, etc.

Chenab, one of the five rivers that give its name to the Punjab, rises in the Himalayas, and during its course of 750 miles receives the Tavi, Jhelum, and Ravi. Under the name of the Trimab it unites with the Sutlej; at Wazirabad it is spanned by an iron railway bridge more than a mile long.

Chenery, Thomas, editor of the *Times* newspaper, was born in 1826 at Barbadoes. Educated at Eton and Cambridge, he was called to the bar. He went as correspondent for the *Times* to Constantinople in the time of the Crimean war, and afterwards became attached to the staff until 1877, when he became editor. He was a thorough Hebrew and Arabic scholar, and was one of the Old Testament revisers. He died in 1884.

Chénier, MARIE-ANDRÉ, poet, was born in 1762 at Constantinople, where his father was French consul-general. After being educated at the Collège de Navarre, Paris, he joined the army, which, however, he soon left and devoted himself to literary pursuits. He rather favoured the revolution in its earlier stages, but, shocked at the excesses which it developed, he denounced it in pamphlets, and was thrown into the prison of Saint Lazare. After six months' incarceration he was executed July 25, 1794. His poems, through his being cut off at so early an age, are necessarily not considerable in number, but he is reckoned to be one of the French leaders of song. Among his best pieces are *La Jeune Captive*, *Le Jeune Malade*, and *Versailles*.

Chenomorphæ, in Huxley's classification, a group of Birds, containing the Ducks and Geese (*see* these words).

Chenonceaux, a celebrated castle near Amboise, a French town in the department of Indre-et-Loire, is built partly on a bridge crossing the river Cher, and was commenced in 1524 by Chancellor Bohier and completed by Catharine de Medici. It afterwards became the property of the Condés. It is still in a good state of preservation, and contains many valuable and interesting relics.

Cheops, a king of Egypt, celebrated as the builder of the largest of the pyramids. He flourished about 3,000 B.C.

Chepstow, a town and port of England in Monmouthshire, is situated on the right bank of the Wye, which is crossed here by Brunel's tubular railway bridge. The tides are higher here than in any other part of Britain, and allow ships of considerable burden to go right up to Chepstow. The old castle is referred to the time of the Conqueror. Among the industries is shipbuilding, and among the exports are cider and mill-stones. (Pop. 1901, 3,067.)

Cher, a river of Central France, with a northerly and north-westerly course of about 200 miles, falls into the Loire 12 miles below Tours. The department covers an area of 2,770 square miles. Its surface is for the most part flat, and agriculture and cattle rearing are extensively followed. Among

Cherokee belonging to themselves. The "Highland" time jointly Virginia. The

Cherry, the fruit of the sub-genus *Cerasus* of the genus *Prunus*, a group of drupaceous trees. *Cerasus* is distinguished by leaves folded in halves in the bud, and a globular fruit with a polished surface and a smooth, roundish stone. Many species grow to a large size, and produce valuable wood for cabinetmakers and musical-instrument makers; the bark is astringent, and there are traces of prussic acid in the leaves as well as in the kernels. Branches of *C. Mahaleb* are made into pipe-stems in Austria, and the bark of *C. virginiana* is a febrifuge. A gum exudes from the trees, which is used by hatters. There are three British species—*C. Padus*, the bird-cherry, or hagberry of Scotland, with flowers in racemes; *C. avium*, the gean, a small tree with few or no suckers, flowers in umbels, and the flesh of the fruit adherent to the stone; and *C. vulgaris*, the dwarf cherry, a shrub with suckers, flowers in umbels, and a readily separable stone. The two latter are probably the originals of all the cultivated varieties. Some new cultivated varieties seem to have been introduced into Italy by Lucullus after his defeat of Mithridates, 68 B.C., and the Kentish cherry or cerise de Montmorency and the Bigarreau or Spanish cherry seem to have been brought to England from Flanders by Richard Haines, printer to Henry VIII. The Kentish are chiefly used for pies; the Morella, a bitter variety, for preserving in brandy, and the May Duke as a dessert fruit. The German Kirschwasser, the Italian Maraschino, and

the Ratafia of Grenoble are liqueurs distilled from the pulp, kernels, and leaves of cherries, mixed with other ingredients.

Cherry Finch, a dealers' name for *Estrellda modesta*, a small Australian bird, of sober plumage, with the crown of a plum or deep cherry colour.

Cherry Laurel. [LAUREL.]

Cherso, an island of Austro-Hungary, lies in the Gulf of Quarnero in the Adriatic Sea. Covering an area of 127 square miles, it yields wine, olives, and various fruits. It has extensive forests. It is united with a neighbouring island, Lussin, by means of a bridge. Its capital, Cherso, has good harbour accommodation and a cathedral.

Chersonesus, the Greek name for a peninsula, and anciently applied to several peninsulas of Europe and Asia, such as *Chersonesus Aurea* (Malacca), *C. Cimbrica* (Jutland), *C. Thracica* (Gallipoli), *C. Taurica* (Crimea), *C. Novantum* (Rhinus).

Chert, an impure kind of flint, varying in colour, but generally black or bluish grey, occurring in nodules, as in the Portland beds, or in layers, as in the Greensand, and breaking with a flat, splintery fracture. Microscopic examination shows it to be often largely composed of much altered remains of Radiolaria (q.v.). In the Carboniferous Limestone are beds and nodules of a very flint-like black chert known as *phthanite*, which contains sponge-spicules and siliceous replacements of calcareous foraminifers and crinoids.

Chertsey, a town of England in the county of Surrey, is situated on the right bank of the Thames. It grew out of a monastery established in 666. Its leading industry is market gardening, and it trades in malt and flour. Near the town, on St. Anne's Hill, Fox used to live, and in a house now marked with an inscription Cowley spent the declining years of his life. (Pop. 1901, 12,762.)

Cherubini, MARIA LUIGI CARLO ZENOBIO SALVATORE, composer, was born in 1760 at Florence. He was a pupil of the famous Sarti, whom he accompanied in 1779 to Milan, and became grounded in the old Italian contrapuntal style. Between 1780 and 1788 he composed eleven operas, amongst them being his *Iphigenia in Aulis*, for a while his masterpiece, and only superseded by his later production, *Les deux Journées*, known in England as *The Water Carrier*. In 1784 he came to London, settling in the following year in Paris, where he remained during the revolution, the consulate, and the empire, and again under the restoration. In Paris he held an appointment in connection with the National School of Music, which attained under his guidance a high standard of excellence. While Cherubini was a director of the Conservatoire, Berlioz was a pupil there. Besides the pieces mentioned, 'he only other of Cherubini's known to English audiences is the *Medea*. He died in 1842.

Chervil (*Anthriscus cerefolium*), a potherb, cultivated by Gerard in Holborn in 1590, occurring now as an escape from cultivation in England, and

largely grown as a seasoning for soup and for salad on the Continent. It is an umbelliferous plant with a stem hairy above the nodes, fine-divided leaves, sessile umbels of minute flowers, and smooth fruit. There is a curled-leaved variety, which is used as a garnish. A related British species, *A. vulgaris*, with smooth stem, stalked umbels, and hairy fruit, is poisonous. The parsnip chervil, *A. bulbosus*, a native of France, has a nutty esculent root.

Chesapeake Bay, in Maryland and Virginia, is the largest inlet from the Atlantic into the coast line of the United States. It is nearly 200 miles long and from 4 to 40 miles broad. Its entrance between Cape Charles on the north and Cape Henry on the south is about 16 miles wide. Around its shores are numerous commodious harbours, and into it flow the Susquehanna, Potomac, and James rivers.

Cheselden, WILLIAM, surgeon, was born in 1688, near Melton-Mowbray. After studying, he, in 1711, began to lecture in London on anatomy, and in the following year was elected a Fellow of the Royal Society. As a hospital surgeon he gained a reputation for his operations for stone, and in 1728 operated successfully on a man born blind. Among his works are *Anatomy of the Human Body*, for many years a text-book; and *Anatomy of the Bones*, with plates, and brief explanatory notes. He died in 1752 at Bath.

Cheshire, a county in England, on the W. seaboard, is skirted on the N. by the Mersey, which separates it from Lancashire. Covering an area of 1,100 square miles, of which fully three-fourths is under cultivation, it provides some of the finest pasture land in England, and the staple produce of the Cheshire farmers is consequently cheese. A considerable acreage is devoted to market gardening, and the markets of Liverpool, Manchester, and other large centres are supplied from here. Rock-salt and coal are extensively worked. There are also brine springs from which salt is made in large quantities. Among other minerals found are lead, copper, firestone, limestone, millstone, and marl. There are extensive and varied manufactures in the large towns of the county, which embrace Birkenhead, Congleton, Chester (the capital), Crewe, Macclesfield, Stalybridge, and Stockport. Trade is facilitated by the numerous railways that traverse the county, and a splendid system of canals, among which is the Manchester Ship Canal for the greater part of the distance it extends. Besides the Mersey, it has also the navigable rivers Dee and Weaver, the former on the W. and the latter in the E. of the county. It contains eight parliamentary divisions, each returning one member, and was erected by William the Conqueror into a county palatine. It did not send representatives to the English Parliament till 1549. (Pop. 1901, 792,863.)

Chesil Beach, a remarkable shingle bank, about fifteen miles long, and from 170 to 200 yards wide, between Burton Bradstock and Portland in Dorsetshire. Its eastern half is separated from the

shore by a channel known as the Fleet. The pebbles consist of flint, chert, granite, Budleigh Salterton quartzite, pebbles, and other materials all derived from the west, and they increase markedly in size eastward. It seems to have originated as an ordinary shingle beach, the Isle of Portland causing it by acting as a gigantic natural groyne; to have deflected several small streams eastwards, as do other shingle beaches at the mouths of the Exe and the Christchurch Avon, for instance; and to have become separated from the mainland by these streams swollen by tidal action and wearing back the low oolite cliffs.

Chesney, FRANCIS RAWDON, explorer, was born in 1789 at Annalong, county Down. After a period at Woolwich, he was in 1805 gazetted to the Royal Artillery. Visiting Turkey in 1829, he surveyed the Isthmus of Suez, and proved the canal to be a practicable undertaking. He next sought to discover an alternative route to India by way of Syria and the Euphrates, and four different times journeyed to the East for this purpose. He was subsidised by a grant of £20,000 by the English Government, but the opposition of Russia interfered with his success. In 1837 he received the Geographical Society's gold medal, and received the honorary degree of D.C.L. from the University of Oxford. He wrote *Past and Present State of Firearms, Russo-Turkish Campaign of 1828-9, Narrative of the Euphrates Expedition*. He died in 1872 at Mourne.

Chess is a game of skill played by two persons on a board of sixty-four squares, coloured alternately black and white. Though it is admittedly one of the most ingenious and fascinating of pastimes, both its origin and development are shrouded in mystery, the solution of which has been long and abandoned by historians. It is generally supposed that it was invented by the Persians, but some authorities ascribe it to the Persians or the Greeks, and others to Solomon's diversions. It was certainly played it when beleaguered cities were held out beyond settlement, and it has been used for settling. Still, we have no reliable evidence that chess had its beginning in the East. It has been played probably for centuries in Persia, India, and China. Many centuries later it was introduced into Spain in one form or another, and thence passed to France. England received it from the Norsemen, and it was introduced into Anglo-Saxony by the Danes. It was played in the twelfth century in France, and it is that of other countries. It was introduced into Japan, at the close of the sixteenth century, and in the eighty-one years since its introduction it has been one colour, and it has been arranged in the same manner, and it has been the dividing line between the two sides, and it has been under certain restrictions.

In the Table by each side of which are the first two to

board, the players having each a white corner on his right hand. Of the sixteen chessmen eight are termed "pieces," in contradistinction to the other eight which are known as "pawns." The pieces occupy the first line of squares next the side of the board, and are king with his bishop, knight and rook (or castle), and queen with her bishop, knight and rook, the bishop being placed next the queen and king respectively, the knight next the bishop, and the rook on the flank. The king and queen stand together at the opening of the game, and the queen is always on a square of her own colour.

As for the moves, the pawn marches straight ahead, one square at a time, but at the first move

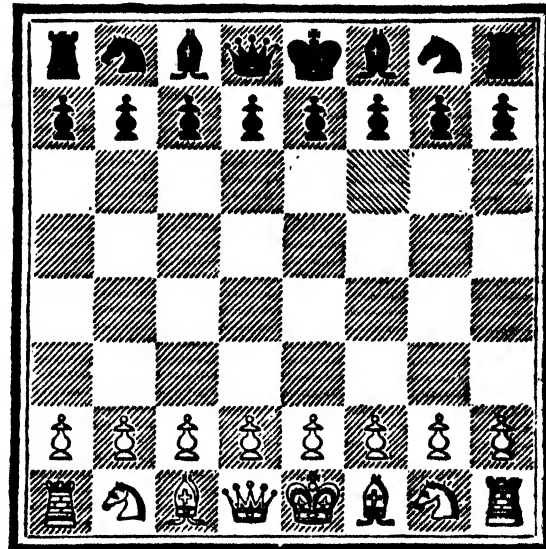


DIAGRAM OF CHESS BOARD.

has the privilege of advancing either one or two squares. In capturing, however, the pawn moves diagonally either to the right or left. It never goes backwards, but when it has forced its way to the eighth square it becomes a piece, with all the powers of a piece. The player has the option of exchanging this advanced pawn for a knight, bishop, or rook, but the queen, as the most formidable fighting piece, is usually selected—hence the phrase “queening a pawn.” There is another peculiarity of the pawn, known as capturing *en passant* (in passing). If a pawn has advanced to the fifth square, and an adverse pawn on either of the adjoining lines, not having moved before, advances two squares, it can be captured by the pawn on the fifth square as though it had moved only one step forward.

The king can only move one square at a time, but in any direction. Once in a game, however, he makes a double move, and this is termed "castling." He can castle on his own side when the bishop and knight have been moved out, and neither he nor the rook has been touched, by moving to the knight's square, the rook being transferred to the bishop's. He can also castle on the queen's side, provided the queen, bishop, and knight are elsewhere than on their respective squares. In this case the king moves to the queen's bishop's square, the rook being brought over to the queen's square. As in castling on the king's side, so on the queen's.

neither rook nor king must have moved previous to the operation. Castling cannot take place if in the act the king crosses a square commanded by a hostile piece, or if the king is in check.

The queen is the most powerful of all the pieces. Placed near the centre of the board, she commands twenty-seven squares, while the rook only commands fourteen, the bishop thirteen, the king eight, and the knight eight. She can move in any direction backwards, forwards, diagonally, or sidewise.

The rook moves in straight lines up or down or horizontally across the board.

The bishop moves diagonally only, and always remains on the colour of its original square.

The knight has a rather eccentric action. It moves two squares at a time, but always from black to white or vice-versa. It is the only piece which can leap over a friend or a foe, and the only one where check of the king cannot be met by interposition. It must either be taken or the king must move. The move with the knight may most readily be understood by putting the piece two squares backwards or forwards, and then one to the right or left.

The object of the game is to drive the adversary's king into a position where he is checked by an opposing piece or pieces (which he cannot take or intercept), and from which he cannot move. He is never really captured, that is, he is never removed from the board, but he is shut in so that he is forced, so to speak, to surrender. This is what is termed "checkmate," and to accomplish this the efforts of the players are directed from the first moves of the game. The different lines of attack are known as "gambits" or "openings," a gambit being the sacrifice of a pawn or piece early in the game by a player who hopes to obtain a strong position thereby. The ordinary "king's gambit" turns upon the sacrifice of the king's bishop's pawn, the "Muzio gambit" involves the sacrifice of a knight, the "Evans' gambit" entails the abandonment of the queen's knight's pawn, and so forth. As there are forty or fifty methods of opening a game, space forbids us even to enumerate them, far less describe them. All games, of course, are not gambits. There are close games in which neither player offers a sacrifice. There are counter gambits where a sacrifice is offered by both players, and there are games known as "defences," where the tactics of the second player give the name to the opening. Any shilling handbook will afford the student all the information he requires on this part of the subject, and also upon the best methods of playing the end game. The beginner should carefully study the openings, otherwise he is likely to be quickly beaten by an opponent who is perhaps his inferior in real strength, but who has given some attention to the gambits. With regard to draws, a game is drawn when towards the close both sides are so equal that a win is impossible. If two kings are alone on the board, of course there must be a draw, since a king cannot even give check, or if there is a knight and king against a king, or two knights and a king against a king, or a bishop and king against a king. If a player also persists in repeated checks, from which the

king cannot escape, the game must be drawn. The same result follows when a king and his pieces are in such a position that they cannot move without exposing the king to check. This is termed "stalemate." It is unnecessary to give detailed instructions as to how a game should be played by a beginner. The principles are simple enough, and the putting of them into practice is a matter of time, care, and observation. But the learner should avoid giving useless checks; he should have a well-defined purpose in view; he should be careful in accepting tempting offers of pawns or pieces; he should watch his adversary's game as carefully as his own; and he should not bring his queen too early into the field, unless, indeed, his opponent is a novice, and then he might perform what is known as fool's mate or scholar's mate on him thus:

WHITE.

1. King's pawn to king's 4.
2. King's bishop to queen's bishop 4.
3. Queen to king's rook 5.
4. Queen takes bishop's pawn (mate).

BLACK.

1. King's pawn to king's 4.
2. King's bishop to queen's bishop 4.
3. King's knight to king's bishop 3.

Here the second player, at his third move, instead of defending his bishop's pawn, attacks his opponent's queen and is at once mated. It may be noted here that during the last thirty years chess-players have adopted a much more cautious style of play. When Paul Morphy came from America in 1858, and vanquished every European player of eminence who was pitted against him, he offered and accepted gambits with almost reckless audacity. Nowadays in a match gambits are seldom offered. The one which has been most thoroughly analysed, the Evans, is perhaps the one where the theoretical disadvantage is smallest. The pawn which is given up is not required for the defence of the king, like the king's bishop's pawn in the Allgaier or the knight's gambit, and the disadvantages are not felt till near the middle of the game. Hence a bold player will sometimes offer it in a match. But the more daring forms of gambit such as the Allgaier and the Muzio are too risky to be tried in serious play. At the present time the Ruy Lopez is one of the most favourite forms of attack, and one that is very difficult to parry. The queen's gambit (sacrificing the queen's pawn on second move) would be a good attack, but it is generally declined. The Steinitz gambit, which involves the moving out of the king under check of the queen, is full of danger for the first player if properly met. Steinitz himself, though he gave his name to a risky game, did much to introduce a cautious style of play.

The laws of chess as sanctioned by the London Tournament in 1883 are rather voluminous, but the more important of them may be briefly summarised:—If the board or pieces have been misplaced at the beginning of a game, or if a piece is left off the board, they can be adjusted if no more than four moves have been played by each player. If it is a player's turn to move and he

touches a piece or pawn he must move it, unless on touching he says "j'adoube" (I adjust) or words to that effect. Should a player touch an adversary's piece without saying "j'adoube," the adversary may compel him to take it unless it cannot legally be taken, and then he may oblige him to move his king; if the king cannot be moved there is no penalty. There are also penalties in the case of a player moving out of his turn, or capturing one of his own pieces. If a piece that cannot be moved without exposing the king to check be touched, it must be replaced and the king moved. If the king cannot be moved there is no penalty. If a player's king has been in check without being observed, he must take back his last move and free his king from the check; if all the moves made subsequent to the check be known they must be taken back. If a player attack a king without saying check, his opponent is not bound to take notice of it. Should a player say "check" without giving it, and the adversary move his king or interpose, he may retract the move. If towards the close of a game a player has a decided superiority of force, such as king and two bishops against a king, the adversary can claim a draw, unless the game is concluded in fifty moves. The giver of odds is entitled to the first move. Though the "laws" of the game are strictly enforced in tournaments and matches, they are little observed in ordinary play, where there is a good deal of give and take. The touch and move rule, however, should always be observed, even in friendly games. One of the best and easiest methods of learning chess is to play one good game such as the following, which has the double advantage of being a fine specimen of Blackburne's blindfold play, and illustrating also a brilliant yet sound combination. (White's 13th move.) The game was played by Blackburne blindfold and simultaneously with another game at the Chess Club on the 5th

WHITE.

Mr. Blackburne.

- 1 P to K 4
- 2 P to K B 4
- 3 Kt to Q B 3
- 4 Kt to B 3
- 5 P to Q 4
- 6 B takes P
- 7 P to K 5
- 8 P takes B
- 9 B to Q 3
- 10 Castles
- 11 P to Q 4
- 12 P to Q 5
- 13 P to Q 6
- 14 P to Q 7
- 15 P to Q 8
- 16 P to Q 9
- 17 P to Q 10
- 18 P to Q 11

Chessylite. A mineral of the class of silicates, and hydrous, occurring in small quantities in the rocks of the Devonian system, and is found in the neighbourhood of Lyons.

Chest. The cavity of the chest or *thorax* is bounded posteriorly by the spinal column and anteriorly by the sternum, is walled in by the ribs and intercostal muscles laterally, and is separated below from the cavity of the abdomen by the diaphragm. Above, the circumference of the chest rapidly narrows, so that the superior aperture of the thoracic cavity is of less dimensions than a transverse section at any lower level. Through this aperture pass the trachea or windpipe and œsophagus, as well as important blood-vessels and nerves. A transverse section at the level of the lower part of the sternum is roughly elliptical in shape. A series of measurements of the healthy adult male chest taken at this level gives, as average results, the following figures:—Circumference, 35 inches; antero-posterior diameter, 9 inches; transverse diameter, 11 inches. The chest is never quite symmetrical, the right half being usually somewhat larger than the left, in association with the greater development of muscles on the right side of the body. Certain deviations from the normal shape of the chest are met with in disease. The flat chest and the pterygoid chest are often found in association with phthisis (consumption). The pigeon breast results usually from prolonged chest mischief in childhood, for oft-repeated paroxysms of coughing, if they occur at a time when the ribs have not acquired the relative inflexibility of the adult condition, cause a straightening of the anterior part of the ribs, and thrust the sternum forward, leading to the shape of chest which has been compared to that which obtains in the bird. A transverse furrow known as Harrison's sulcus is also often produced in those who as children had "delicate chests"; the most common deformity of the chest is, however, the rickety chest. [RICKETS.] Curvature of the spine produces, of course, a deviation from the natural shape of the chest. In the thoracic cavity are contained the lungs and the heart with the vessels entering and leaving it. The œsophagus traverses the whole length of the chest to leave it below by an aperture in the diaphragm; and by its side through the greater part of its course runs the thoracic duct. The spaces lying in front of and behind the heart, and unoccupied by the lungs, are called the anterior and posterior mediastina respectively. Diseases of the chest are dealt with under the special articles on **HEART, AORTA, LUNGS**, etc.

Chester. 1. A city of England, capital of the county of Cheshire, situated on the Dee, 16 miles S.E. of Liverpool. It is the ancient *Deva* or *Deva Castra*, and stands on a rocky elevation enclosed in great part by massive walls, which, being seven or eight feet thick, make an agreeable promenade. The principal thoroughfares, which diverge to the cardinal points of the compass, still remain as the Romans cut them out of the rock, and have their carriage ways several feet below the level of the adjacent houses. Over the shops for foot-passengers are piazzas or "rows," attained by flights of steps at convenient distances. There are also many sixteenth-century timber houses, and even the

modern buildings are put up in the same style, thus giving the city an antique appearance. Its old and interesting cathedral was recently restored under the guidance of Sir Gilbert Scott, and the see of Chester dates from the time of Henry VIII. Among its other ecclesiastical buildings are St. John's church, a fine specimen of Saxon architecture, and Trinity church, in which are the tombs of the poet Parnell and Matthew Henry. Other noteworthy edifices are the town-hall, the post-office, the public library, and the music-hall. It is well supplied with railway facilities, and has an additional means of transit in the Dee. Amongst its industries are lead manufactures, boot and shoe making, chemical works, iron shipbuilding yards, and iron foundries. It is a county in itself, and returns one member to Parliament. It is rich in historical associations from the time of the Roman occupation to the struggles between England and Wales. It also ardently espoused the cause of the king against the Parliamentarians in the seventeenth century, when the inhabitants were starved into surrender, (Pop. 1901, 13,017.)

2. A city of the United States, in Delaware county, Pennsylvania, situated on the Delaware river, and is one of the oldest towns in the state. Founded by the Swedes in 1643, it was originally named Upland. It has extensive ship-building yards, and manufactures of cottons, woollens, etc.

Chester, JOSEPH LEMUEL, genealogist, was born in 1821 in Norwich, Conn., U.S.A. In 1858 he came to England and edited the *Registers of Westminster*. Extracts that he made from the Bishop of London's register are published under the title *London Marriage Licences*. He received the degree of D.C.L. from Oxford. He died in 1882 in London.

Chesterfield, a town of England, in Derbyshire, is situated on a small stream, the Rother, and is connected with the Trent by canal. It is irregularly built, and All Saints' church has a spire 228 ft. high and 6 ft. off the perpendicular. Among its manufactures are ginghams, lace, earthenware, and machinery. There are also collieries, iron mines, and blast furnaces in the neighbourhood. Chesterfield gives its name to a parliamentary division of the county. (Pop. 1901, 68,559.)

Chesterfield, PHILIP DORMER STANHOPE, EARL OF, statesman, was born in London in 1694. Studying at Cambridge, he was returned to Parliament in 1716 for St. Germans, Cornwall, which he represented till 1726, when he became Earl of Chesterfield. In 1728 ambassador to Holland, 1744 Lord-Lieutenant of Ireland, and 1746 Secretary of State; he was in 1748 obliged to retire from public life on the ground of ill-health. He gained some reputation as an author by his *Letters to his Son*, and his essays. He died in 1773.

Chestnut, the fruit or nut of *Castanea vulgaris*, a fine tree belonging to the order *Quercineæ*. The tree may reach a large size, and has deeply furrowed bark and large glossy serrate but simple leaves in tufts, which turn yellow in autumn. Its

flowers are in long pendulous catkins, those near the apex being staminate. The pistillate flowers are grouped, from two to five together, within a densely spinous cupule which splits into four valves. The dark brown nuts are surmounted by the remains of the perianth, being "inferior" fruits. In a wild state two or three kernels or seeds, separated by a membrane, are contained in each nut; but the Lyons marron, the most valued cultivated race, contains only one. The tree is native from Portugal to the Caspian and in Algeria, and is represented by allied forms in Japan and temperate North America, flourishing in the Alps and Pyrenees at 2,500 to 2,800 feet above sea-level. Though the Tortworth chestnut in Gloucestershire, now over 12 feet in diameter, was a large tree in the reign of Stephen, the species is not indigenous to Britain. Its timber resembles oak, but is softer and more brittle. The roofs of many old buildings, including Westminster Abbey and the Louvre, once thought to be chestnut, are now known to be oak. When felled the tree sends up abundant coppice-shoots, furnishing good cover for game and valued also for hop-poles. The fruit ripens over about the same area as does that of the vine; but the Downton variety, with short spines, the Devonshire, and the Prolific do so in this climate. The large cotyledons of the exalbuminous seeds contain but little oil, and are so farinaceous and so important as a staple food in Sicily and some other parts of Southern Europe as to be fairly reckoned among bread stuffs. The chestnuts eaten in England come mainly from Spain, Italy, Belgium and Holland.

Chestnut, HORSE (*Æsculus Hippocastanum*), a tree, frequently 50 or 60 feet high, belonging to the order *Sapindaceæ*, a native of Asia, introduced into Europe about the middle of the 16th century. It has a smooth stem with soft, white, valueless, rapidly-growing wood, thick branches, and very large gummy terminal buds. The leaves are in opposite, decussate pairs, with stalks nearly a foot long, and seven large leaflets arranged palmately. These are remarkable for rising from a pendulous to a horizontal position. The flowers are in large conical clusters, technically known as racemes of cincinnal cymes and are asymmetric, having five sepals, five petals, seven stamens, and three united carpels. The petals are white with pink and yellow honey-guides at their bases. Only the lower flowers of a cluster have an ovary, and this forms a fleshy dehiscent three-chambered fruit set with short scattered prickles. Each chamber contains two ovules, but the seeds are fewer in number. They have a polished brown testa with a large, rough, circular hilum, and so resemble the fruits of the true chestnut (q.v.), a tree of an entirely distinct group. The seeds are exalbuminous, and the cotyledons are farinaceous but bitter, and are, therefore, but rarely used as human food. They are eaten by deer, goats, and sheep, and are said to be good for cattle with coughs. They produce a slightly soapy lather with water. The scarlet horse-chestnut, often grown for ornament, belongs to the genus *Pavia*, which differs in

being smooth-fruited. Allied species are known in America as Buckeyes.

Chettle, HENRY, dramatist, flourished in the latter half of the sixteenth century. Apprenticed to a stationer, he first came into public notice as editor of Green's *Groat's Worth of Wit* (1592). He appears besides to have written thirteen plays, and to have been joint author of thirty-five others, among the latter *Patient Grisiel* and *Jane Shore*. He was described as one of "the best for comedy among us;" yet he was never otherwise than pecuniarily embarrassed, and for the sum of £3 signed a bond in 1602 to write for the Earl of Nottingham's players alone. He died about 1607.

Chevalier, in its primary sense, has the same meaning as its doublet, cavalier, *i.e.* horseman; in its secondary sense it was a title of French nobility, generally applied to the younger sons of nobles, who sometimes, put to the shifts to which younger sons are liable, did not perhaps dignify the name. Hence, possibly, the application of the name of *chevalier d'industrie* to a black-leg, a man living by his wits. The Chevalier Bayard is well-known to all, and readers of French literature may be acquainted with the Chevalier Faublas. The name was also applied to the son and grandson of James II. of England.

Chevalier, MICHEL, economist, was born in 1806 at Limoges. He joined the St. Simonians, and was sentenced to a year's imprisonment for being associated with Père Enfantin in editing *Le Livre Nouveau*. Subsequently he retracted what he had written. He was sent by the United States to inquire into their water systems of commerce. He published *Des Intérêts Matériels* in 1838 he was made professor of political economy at the Collège de France. He was Blanc's socialism, which he published in *l'Organisation du Travail*. He was and aided Cobden in the commercial treaty between France and England. He died in 1879 at Montreuil.

Chevaux de Frise (chev-fry) denotes a contrivance of iron spikes or a breach or a fortification. The word is especially applied to a horizontal row of iron spikes. In the English army they are used for the holes for the iron spikes in the conventional tube. A similar contrivance is known in the mediæval war, fitted with a chain.

Cheviot, a mountain range in the Northumbria N.E. for the summits are

Fell (2,020 ft.), and in them rise the rivers Liddel, Tyne, and Coquet. They are of trap formation, porphyry, and greenstone, and intersect the old red sandstone and mountain limestone strata. They yield excellent pasture, the Cheviot breed of sheep being celebrated. In former times they were the scene of many fierce struggles between the English and Scots, and are commemorated in the famous ballad of *Chevy Chase*.

Chevreul, MICHEL EUGÈNE, chemist, was born in 1786 at Angers. Educated at Paris, he became professor of special chemistry at the Gobelins, and in 1823 published a treatise on animal oils, for which he received a prize of 12,000 francs from the Society for the encouragement of National Industry. In 1830 he succeeded Vauquelin, his former master, as professor of chemistry in the Collège de France, and in 1864 became director of the Museum. In 1886 the centenary of his birth was celebrated, and three years later he died. His works are on dyeing, on colours, history of chemical investigation, theories of matter, etc.

Chevron, an arrangement of two lines or bars inclined to each other at a similar angle to that of the rafters in a roof, whence the name, from the Latin *capreolus*. In *Architecture* the word denotes a zigzag moulding of the Norman and Transition periods. In *Heraldry* it denotes a device of this form upon a shield, a similar device with narrower bars being called a *chevronel*, or the expression *per chevron* being used when the space between the bars is filled up. The word is familiar as denoting the marks of rank upon the arm of a non-commissioned officer of the army or navy, varying in the former from the four chevrons or stripes of the sergeant-major or staff-sergeant, to the single stripe of the lance-corporal.

Chevrotain, or MOUSE DEER, any species of the family Tragulidæ, with two genera, *Tragulus* (Asiatic) and *Hyomoschus* (African), the latter aquatic in habit. The family, which existed in Europe in Miocene times, connects the deer with the swine, and has some affinities to the camels. The species are diminutive and graceful, the body is about the size of that of a rabbit, and the legs are long and slender. There are canine teeth in both jaws; both sexes are hornless, and each limb has four digits.

Chevy Chase, a name sometimes applied to the celebrated border battle—Otterburn (q.v.)—between Percy and Douglas, the memory of which has been preserved to modern times by the stirring ballad of "Chevy Chase," one edition of which may be found in the Percy *Reliques*, though a more modernised form is the most widely known. The word "chevy" or "chivvy," well-known to every boy, is said to be of gipsy origin, and to signify to goad or chase.

Cheyennes, a predatory North American tribe belonging to the Algonquin family, whose original camping grounds lay between Lake Superior and the Upper Missouri, on the Upper Red River of the North, which flows to Lake Winnipeg. Driven

thence by the Dacotahs during the eighteenth century, they withdrew west of the Missouri to the Black Hills about the sources of the river from them named the Cheyenne. This word is a corruption of the French *chiens* ("dogs"), a term usually applied to them by the Canadian squatters. Later, they extended their excursions as far as New Mexico, and still infested the banks of the Platte and Upper Arkansas rivers so late as 1850. At that time they numbered 3,000, but have since been much reduced by their wars with the hostile Blackfeet and Pawnee nations.

Cheyne, GEORGE, doctor, was born in 1671 at Methlick, Aberdeenshire. He began to practise in London in 1702, being chosen a Fellow of the Royal Society in the same year. He was noted for his corpulence, being 32 stone in weight; he advocated a milk and vegetable diet, which he practised with such good results that he never ceased to recommend it in all similar cases. He wrote numerous medical treatises, and died in 1743.

Cheyne, THOMAS KELLY, Biblical scholar, was born in 1841 in London. Educated at Oxford, he became a fellow of Balliol in 1869, rector of Tending, Essex, in 1881, and Oriel Professor of the Interpretation of Holy Scriptures at Oxford, and Canon of Rochester in 1885. He was appointed a member of the committee for the revision of the Old Testament. Besides scholarly contributions to periodical literature, he has also published *The Prophecies of Isaiah* (1880), *Exposition of Jeremiah and Lamentations* (1883), and *The Book of Psalms* (1888).

Chhatisgarh, a district of India in the central provinces, covers an area, with its seven small feudatory states, of nearly 40,000 square miles. It is a fertile region and yields large quantities of grain.

Chiabrera, GABRIELLO, poet, was born in 1552, at Savona. He imitated Pindar, and with such success that he is called the "Pindar of Italy." He also wrote epics, bucolics, and dramas. At the age of 50 he married Lelia Pavese, and died in 1637, aged 85.

Chiana, a small river of Italy; and the ancient *Chanis*, waters Tuscany and Umbria. It is now artificially divided into two branches, one flowing into the Arno, and the other into the Paglia. The two are connected by the Chiana Canal, completed in 1823, whereby a large tract has been rendered fertile.

Chiapas, a state of Mexico, on the Pacific, with Guatemala on the S.E., covers an area of over 16,000 square miles. Comprising a portion of the tableland of Central America its climate is to that extent wholesome, but in the lower regions is hot and sickly. Maize, sugar, cacao, and cotton are produced, but immense forests still cover the most part. Its capital is San Cristoval, and its chief rivers, Usumasinta, Tabasco, and Rio Chiapas.

Chiaroscuro, a word used in painting and engraving to express the combined effect of lights and shadows, *i.e.* the diffusion of light in shade

and the softening effect of shade upon light, such an arrangement as best imitates the effect of the lights and shades in nature. The most successful handlers of chiaroscuro among painters are Titian, Correggio, Rubens, and Rembrandt. *The Elapement* by Wright in the National Gallery is an interesting example of it.

Chibchas, one of the civilised peoples of the New World, who at the time of the discovery occupied a territory about 6,000 square miles in extent in the province of Cundinamarca, Colombia. They were divided into two hostile nations, with a collective population of over a million, one ruled by the *Cipa* ("lord") of Bacata or Bogota (now Funza), the other subject to the *Zaque* ("chief") of Ramiriqui and Hunsa (now Tunja). The Chibchas, also called Muyscas, had attained a considerable degree of culture, as shown by their paved highways, suspension bridges, temples, colonnades, statues, hieroglyphics, weaving and dyeing, weights and measures, and especially their great skill in gold and silver work. Their descendants have been completely merged in the Spanish population, and, unlike their Peruvian neighbours, have ceased to speak the national language, of which nothing survives except a few songs and an unpublished dictionary.

Chibhâli, an Aryan people occupying the hills between rivers Chinâb and Jhelum, North-West India; said to be Rajput immigrants, who have adopted the Mohammedan religion, whereas their Dogra neighbours and kinsmen have remained Hindus. Chief divisions and castes: Sudan, Thakar, Pâl-jarâl, Gakkar; speech, a Neo-Sanscritic idiom, closely related to the Pothwâri of West Punjâb.

Chica, or CHICO, (1) a dyestuff, producing an orange-red hue, made by boiling the leaves of the *Bignonia chica*, a climbing plant found upon the banks of the Orinoco and its tributaries the Meta and Cassiquiare. The Indians use it for painting their bodies. (2) A kind of maize beer, brewed and drunk in Chile.

Chicacole, a town of India in the Presidency of Madras and Ganjam district, is situated on the Languluja river. Formerly a military station, it is now noted for its muslin manufactures. It is mainly built of mud.

Chicago, a city of the United States, in Illinois, and the capital of Cook county, is situated on the S.W. bank of Lake Michigan and on both sides of the Chicago river. The area of the city was originally a swamp, but it has been drained, and filled in, and many even of the largest buildings raised by ingenious engineering appliances about six feet. It exceeds 23,000 acres, and is divided by the river into three parts, viz. the north, south, and west. These are connected by numerous bridges and tunnels. Its spacious streets are laid out at right angles and are adorned with rows of fine trees. Among its public buildings of note are the county court house and city hall erected at a cost of 6,000,000 dols., the United

Chicasaws. a Native American allied to the Chickasaws. They lived on a plateau between the Mississippi and the Ohio rivers, now been a large part of the land is a reserve. They were a brave people, and they were one of the most powerful of the tribes of about 1700. The Cherokees and the Chickasaws were the only tribes of the Southeastern United States who were not members of the Iroquoian family. They were the only tribe of the Southeastern United States who were not members of the Iroquoian family. They were the only tribe of the Southeastern United States who were not members of the Iroquoian family.

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Chicken Pox, or VARICELLA, is a specific contagious disease, almost exclusively affecting young children, the characteristic feature of which is a peculiar vesicular eruption. Varicella occurs in epidemics, and until recent years was often confounded with small-pox (*variola*). The two diseases are, however, quite distinct from one another. Chicken-pox is usually a trivial affection, and is never fatal, save in very unhealthy subjects, or when it occurs in the very rare form known as *varicella gangrenosa*. The period of incubation is somewhat uncertain; it is said to average about

fourteen days. The onset of the disease is often marked by slight fever, and then after an interval of some twenty-four hours the rash appears. Reddish papules are first developed, and these rapidly become vesicular; so that a number of rounded minute blebs, containing clear fluid, are seen to be scattered over the body. The back and shoulders are favourite situations for the varicella rash. The rapid development of the vesicles, and the fact that they often appear in successive crops, and rarely become pustular, seldom fail to distinguish the disease from the formidable variola. Children affected by varicella should be carefully isolated until all the scabs have disappeared. There is no specific treatment for chicken-pox. The disease runs its course in almost all cases without mishap; all that can be done is to adopt ordinary hygienic precautions, and to administer tonic remedies. In 1902 it was made a notifiable disease for at least three months.

Chick-pea (*Cicer arietinum*), an annual leguminous plant, apparently a native of Armenia, but possibly also of Southern Europe. Its leaves consist of from seven to fifteen egg-shaped, toothed leaflets; its flowers are white or pink and solitary, and its pods from an inch to an inch and a half long, rhomboidal, inflated, and containing two seeds. These being supposed to resemble a ram's head give the plant its specific name. The stem and leaves exude a dew of oxalic acid which crystallises on their surface and will destroy the boots of a person walking through a field. The plant has long been largely cultivated in India under the name of Gram, the seeds being ground into meal, toasted or candied. In France they are used in soups.

Chickweed (*Stellaria media*), one of the commonest English weeds, a small annual belonging to the *Caryophyllaceæ*, with five sepals, five or fewer two-cleft white petals of small size, ten stamens, three styles and a six-valved capsule, but readily recognised by a single line of small hairs along the stem, changing from one side to the other at each pair of leaves. It is collected as a food for cage-birds. It is one of the most widely diffused of flowering plants.

Chiclana, a town of Spain in Andalusia, 12 miles S.E. of Cadiz, noted for its mineral baths. It is built of snow-white stone and produces linen and earthenware.

Chiclayo, a town of Peru and capital of the department of Lambayeque; it manufactures soap and leather, and has rice mills and distilleries.

Chicopee, a town in Hampden county, Massachusetts, U.S., situated on the E. bank of the Connecticut river. Among its manufactures are cotton, bronze cannon, statuary, cutlery, locks, etc.

Chicory (*Cichorium Intybus*), a perennial plant belonging to the *Compositæ*, closely related to the endive (q.v.) and less closely to the lettuce (q.v.) and dandelion (q.v.). It has a long tap-root and rigid branched stem with a milky juice and few cauline leaves, a rosette of pinnately-lobed radical leaves, and large sessile heads of brilliant

light blue strap-shaped florets. The heads are surrounded by two rows of bracts, the outer reflexed, and the fruits are surmounted by a rudimentary calyx. The leaves are blanched as a salad and the roots are largely mixed with coffee. Chicory is itself adulterated with carrot, mangold-wurzel, oak-bark, tan, mahogany dust, baked horse-liver, venetian red, etc. It is unwholesome if used constantly in any large proportion to coffee, and has none of the stimulating effect of the latter substance. The plant is wild throughout Europe and Western Asia, growing chiefly on dry soil, and is cultivated in some parts of England.

Chief, EXAMINATION OF WITNESS IN. [EVIDENCE, WITNESS.]

Chief Rents, the rents payable by the freeholders of manors, also termed *quit rents* (*quiete redditus*), because the tenant thereby goes quit and free of all other services.

Chiem-See, a lake of Upper Bavaria, 48 miles from Munich, receives the waters of the Achen and Prien rivers, and discharges by the Alz into the Inn. It lies at an altitude of 1,650 feet above sea-level, and contains famous fish.

Chieti, a city of Italy and capital of the province of Chieti, stands on a hill near the right bank of the Pescara river, about 8 miles from the Adriatic shore. The see of an archbishop, it has a fine Gothic cathedral, and manufactures cloth and silk. It occupies the site of the *Teate* of the Romans, and in 1524 St. Gaetano founded here the order of the Theatines.

Chiff-chaff (*Phylloscopus collybita*, in older classifications *Sylvia rufa* or *hippolais*), a small Warbler (q.v.), reaching England as an early summer visitor. The general plumage is olivaceous above, lighter on the under surface. The popular name is derived from the note of the bird.

Chigi, AGOSTINO, of Siena, was the founder of a powerful Italian family, whose head is Prince of Campagnano and Duke of Ariccia. He became banker to the popes, and died in 1512. FABIO, a descendant of the preceding, wore the tiara as Alexander VII., from 1655 to 1667. FLAVIO, another descendant, born in 1810, became Bishop of Mira, after serving in the papal guard, and ultimately reached the rank of cardinal. He died in 1885.

Chignon, a French word denoting primarily the nape of the neck, and then used to denote the roll of back hair of women, arranged with or without padding at the back of the neck. This arrangement of hair was prevalent about twenty years ago in England, but like other fashions it became exaggerated; the hideous masses of artificial padded hair offended all taste by their monstrosity, and the fashion was abandoned.

Chihuahua, a city of Mexico and capital of the state of the same name, is for the most part well built and has an imposing cathedral. It is in a silver mining district and does a considerable trade. The aqueduct that supplies it with water is three miles long. The state is the largest in Mexico, covering an area of over 83,000 square

miles, great tracts of which are not arable. It is, however, well adapted for stock-raising, and produces cotton in the south. Its leading productions are gold, silver, and copper.

Chikara (*Tetraceros quadricornis*), a small Indian antelope with two pairs of horns, one in front of the other. In the only other species of the genus the anterior pair are rudimentary,

Chilblain, a localised inflammation of the skin of the fingers, toes, ears, and other parts in which the free circulation of blood is interfered with by chilling of the surface. Chilblains rarely affect adults, though those women who never take any form of exercise may be sufferers. In children they are of common occurrence in the winter months, and cause much discomfort by the tingling they produce, while in neglected cases actual breach of surface ("broken chilblains") may occur. If due attention be paid to adequately protecting the legs and feet by woollen stockings, and the hands by warm gloves, and to securing a satisfactory amount of exercise, chilblains should rarely or never occur in this climate. When children are inadequately clothed, are allowed to stand about in wintry weather, and then (when the extremities become blue with cold) are forbidden to approach a fire to warm their hands or feet, the conditions for the establishment of chilblains are effectually secured. Consequently when a child complains of chilblains the most important thing to do is to find out the cause of the mischief, and remedy it. Stimulating applications such as the tincture of iodine, are certainly of some service (the friction incident to their application being of use in promoting the languid circulation), but more have formed scrupulous use of the use of unguentum zinci, unguentum camphoratum, or any such form of application is inadvisable. It is better to adopt measures of this kind only in the use of the ill-fitting boots, and to avoid such abominations, if possible. Parents are too apt to rub in the latest fashion, and so the actual and remedial measures pass unnoticed.

Child, FRANCIS, an English writer, born at Boston, Massachusetts, in 1792, where he afterwards became a resident. He made his first appearance in literature in 1818, with *Old Plays*, and in 1821, with *English Ballads*, a collection of English ballads.

Chiloé, a small island in the Pacific Ocean. As a naval station it was purchased by England for £200,000, and is now best known on account of its *Observations on Money*. It is the colonial capital of the province of Chiloé.

Child, JAMES, an English writer, born in 1802 in Medford, Massachusetts. He was a member of the

was Francis, and in 1828 she married David Lee Child, a journalist. Together they edited the *Anti-Slavery Standard* in New York. Her works are chiefly novels. She died in 1880.

Child-stealing. [KIDNAPPING.]

Chili, or CHILE. *Geography*. The Chilean territory, containing an area of 300,000 miles, extends from the summit of the Andes on the east to the Pacific Ocean on the west, and from the Camarones river on the north to Cape Horn, the limit of the South American continent, being in this portion separated from Argentina by an imaginary line that runs from Mount Aymon to Cape Virgin and from this cape directly south to the ocean.

The country is a narrow strip of land principally consisting of the rugged western skirts of the lofty Cordillera, which is intersected by a great number of rivers of violent current, with fertile valleys; it is remarkable for a great diversity of climate according to the degree of latitude and the height of the land, and for the variety of its geological and topographical conditions.

Geographers distinguish four zones in Chili:—The *northern* or *mineral* zone, which comprises the province of Atacama (immensely rich in silver), Coquimbo (rich in copper), and the territories of Antofagasta and Tarapacá, famous for the saltpetre, borax, and gypsum, which they produce to an enormous extent. The *second*, or *agricultural* zone, is formed of a great central plain, or succession of valleys, which seem to be the basins of emptied lakes, situated between the Andes and a parallel range; this zone comprises the provinces of Valparaiso, Aconcagua, Santiago, Colchagua, Talca, Maule, Nuble, Linares, and Concepcion; it produces many cereals and rich wine. Araucania, the *third* zone, that extends from the Bio-Bio to the Tolten rivers, is the most beautiful part of Chili, and the home of 30,000 indomitable Indians, famous in history and Spanish poetry on account of their great valour; but now from the north and the south Araucania is being peopled by the white man, and the Indians are doomed to submission, or to emigration across the mountain gorges to the deserts of Argentina. The *fourth* zone is a wild and very picturesque region of lakes.

The name Chili signifies cold in the native Peruvian language; the ancient *Incas*, in giving the name, referred to the eternal snows of the mountain peaks; but the climate is generally temperate and so healthy that no epidemics have ever been known in the country except small-pox. It is worthy of note that in Chili there is an absolute lack of ferocious animals and of poisonous insects of any class.

Several violent earthquakes have shaken Chili from the Spanish conquest to the end of the 18th century, but recently they have not been severe, excepting that of 1822, which destroyed Valparaiso, and that of 1835, Concepcion. There are about 70 volcanoes in the Chilean Cordillera; the highest are the Aconcagua (22,418 feet) and the Tupungato (21,660 feet). Off the coast there are many islands and archipelagoes. The largest island is Chiloe. Juan Fernandez island was the scene of the solitary

life of Alexander Selkirk, the prototype of Robinson Crusoe.

The *population* (1905) of Chili is 3,399,928. The capital, Santiago, has 378,000, and Valparaiso 175,000. Two-thirds of the population live in the rural districts. The Chilian is of pure Spanish descent, or of Spanish blood mixed with Araucanian, a race that in vigour of body and of character can compete in work and war, on land and sea, with the best in the world.

The political *constitution* is very much like that of the United States, but the spirit of unity is much stronger. The civil laws are codified. The educational system resembles that of France; 160,000 children, boys and girls, attend the public schools, and 31,000 private ones.

The army is a national militia in which every able-bodied citizen is compelled to serve from his 18th to his 45th year inclusive. The active army on war footing is about 60,000, exclusive of the reserve army, said to number about 33,000. The navy is the finest in South America. Commerce is very prosperous. The largest import trade is with England. The *industries* are chiefly agricultural and mining.

History. Don Diego de Almagro was the first conquistador. He conquered Chili in 1536; he was one of Pizarro's lieutenants, and quarrelled with his chief on account of the distribution of treasure plundered in the conquest of Peru. Almagro had been preceded by a Spanish deserter in Chili, called Barrientos, who taught the Indians how to fight the Spaniards. After much suffering and hard fighting Almagro returned to Cuzco, where he was beheaded. Pizarro then sent a daring young officer called Pedro de Valdivia with 140 soldiers to explore and conquer the country, which he did as far as Valdivia (1541), where he founded that city, as well as those of Serena, Valparaiso, Concepcion, and seven more in Araucania, but all of them were soon destroyed by the brave Araucanians, who also killed Valdivia himself in 1553. The colony was ruined, and other conquistadores were sent in the next century by Spain, who succeeded in conquering the country, only at the expense of millions of money and hundreds of thousands of soldiers. In the seventeenth century the colony suffered intensely on account of pirates, earthquakes, and droughts, and was abandoned again until the eighteenth century, when liberal concessions were made by the Crown of Spain to strong, honest, hard-working people of Biscay, who quickly raised the land to prosperity. Many distinguished men were produced in that period, who rose against the government of the mother country, declaring the independence of Chili. A Spanish army from Peru reconquered the colony, but General San Martin, the Argentine patriot, crossed the Andes, and in the splendid victories of Chacabuco and Maipo destroyed the Spaniards. Lord Cochrane was the admiral of the Chilian ships, assisted by the young and brave Blanco Encalada. O'Higgins was the first dictator of the country, but in 1823 he was overthrown. From that time political matters were very unsettled until 1830, when, after the battle of Lircay, Prieto was named

constitutional president. The country was governed in peace until the war with Peru and Bolivia, in which Chili was victorious (1839). Thenceforward, under the Constitution, Chili distinguished itself above all the South American states in the enjoyment of an excellent, though rather oligarchical, government. In 1865 Chili assisted Peru in her war against Spain, and Valparaiso was bombarded by the Spanish fleet. In 1879 the Republic was engaged in another long war with Peru and Bolivia, which resulted in the conquest of the territories of Antofagasta and Tarapacá, after bloody battles on sea and land, of which Miraflores, the decisive one, is well worthy of mention.

In 1891 a civil war was produced by the conduct of President Balmaceda, who was defeated, and committed suicide. The boundary dispute with the Argentine Republic was settled by the late King Edward VII. in 1902, and that with Bolivia, after being nearly twenty years in dispute, in the year 1905.

Chili Pepper. [CAPSICUM.]

Chili Saltpetre consists of nitrate of soda, NaNO_3 . It hence differs from nitre or saltpetre, KNO_3 , only in the substitution of sodium for potassium. It crystallises in rhombohedra closely resembling cubes, and is also called *cubic saltpetre*. It occurs largely as a deposit on the soil in Peru and Bolivia. Being cheaper, it is largely used instead of nitre for the preparation of nitric acid. It cannot be used in place of nitre for the production of gunpowder, however, as it attracts moisture from the air and deliquesces. Small quantities of sodium iodate, NaIO_3 , are generally present also, and it is hence employed as a source of iodine.

Chillan, a town of Chili and capital of the province of Nuble, is a commercial centre of some importance. It is composed of adobe houses, built low by reason of the prevalence of earthquakes. It is connected by rail with Santiago and Talcahuano.

Chillicothe, a city of the United States of America, and capital of Ross county, Ohio, is situated on the right bank of the Scioto river and on the Ohio canal. Among its manufactures are carriages, paper, iron, leather, and agricultural implements. It was the capital of the state from 1800 to 1810.

Chillingworth, WILLIAM, divine, was born in 1602 at Oxford. Elected a scholar in 1618 and then in 1628 a Fellow of Trinity College, he devoted himself to the question of paramount interest at that time, viz. the differences between the Anglican and Romish churches. The result was that he adopted the doctrines of the latter, and in 1630 went to Douay. Here further investigation led him to renounce the claims of Rome to infallibility, and he was unable to take orders in the Church of England through the Thirty-nine Articles. He now got entangled in a mass of controversy with different Catholics, and out of this came his most celebrated book, *The Religion of Protestants a Safe*

Chimney (Gk. *kaminos* ; Lat. *caminus*, a hearth) is a generic word, denoting the tube or other contrivance by which the smoke of a fire within a building or other enclosed space has access to the outer air. The method of chimney building in ancient times is not much known. In more modern times there has been constant progress, from the simple hole in the roof by which the smoke might escape if it could from the Saxon hall, through the wide chimney of mediæval houses, which was roomy enough to allow the construction of unsuspected hiding-places, and which has lingered on in the wide chimney of old farmhouses down to the modern flue, which, built with a knowledge of the principle that narrowing the aperture increases the draught, may be reduced by means of a register to a diameter of only a few inches. With a view, also, of giving a steady and strong upward draught, modern chimneys are carried to such a varying height above the house-roof as frees the chimney from eddies of wind caused by the irregularities of the roof, and to the top have been added various contrivances for ventilation, a still further protection from eddies of wind. This increased height has made chimney building of some importance from an architectural point of view as giving scope for ornamentation, and some of the chimney stacks of Elizabethan houses and their modern imitations are quite works of art. Of the chimney of feudal times, with its wide throat and its horizontal opening to the outer air, called the *louvre*, some ancient castles, notably that of

Rochester, give us examples. To show how chimneys have been subservient to the architect's and sculptor's arts by giving occasion for the construction of elaborate ornamental chimney-pieces would require a separate article. In 1842 an Act was passed to put a stop to the practice of boys climbing chimneys to clean them, but it was some time before the Act was enforced generally, at least in country places. Chimneys sometimes, through neglect or accident, take fire, but the fire may easily be put out by stopping up with a wet blanket or other such like thing the opening of the fireplace so as to prevent air from below from obtaining access to the fire.

Chimney, FACTORY. The intensity of the draught through a fire may be increased in two ways. A blast of air may be forced through it by bellows, fan, or other pumping machinery; or a greater current of air may be induced to pass through by the use of a high chimney. This second method is much employed in factories, for, besides producing greater draught, the products of combustion, which in many cases are objectionable and injurious to animal and vegetable life, are discharged at a sufficient height to render them less harmful. Inside the chimney there is a column of hot gases; outside the air is colder, and a column of this cold air of the same length and sectional area as the chimney would be heavier, and would exert a greater pressure at the base of the chimney. Hence the difference in the pressures of these two columns will force the inside gases upwards, this force depending on the temperatures of the burnt gases and of the surrounding air, and on the height of the chimney. Other things being equal, the draught is increased by lengthening the chimney; also the draught is greater on a cold day than on a hot day, greater at night than in the daytime. The Townsend shaft in Glasgow has a height of 468 feet; St. Rollox shaft, Glasgow, 456 feet; and Mechernich shaft, Cologne, 441 feet. These are among the highest chimney-shafts.

Chimpanzee, any anthropoid ape of the genus *Anthropopithecus*, from tropical Africa. (The name *Troglodytes*, though still found in text-books, should be dropped, as it properly designates a genus of birds, of which the Wren (q.v.) is the type.) The species are of large size, with very long arms, long narrow hands, and feet that can be planted flat on the ground so that an erect or nearly erect posture can be readily maintained, though their favourite mode of progression on the ground is a kind of canter on all-fours, the back of the knuckles being called into play. There are no callosities on the haunches, nor is there a tail. These animals dwell in the deep forests, and are partially arboreal in habit. They are said to form small societies and to build a kind of shelter for the female and her young in the branches of trees, the male passing the night on the ground. Their diet is chiefly fruit, but, at least in the case of the Bald-headed Chimpanzee, probably varied in the wild state, as it certainly is in captivity, by small mammals and birds. The number of species is not determined; but, omitting the gorilla (q.v.) as

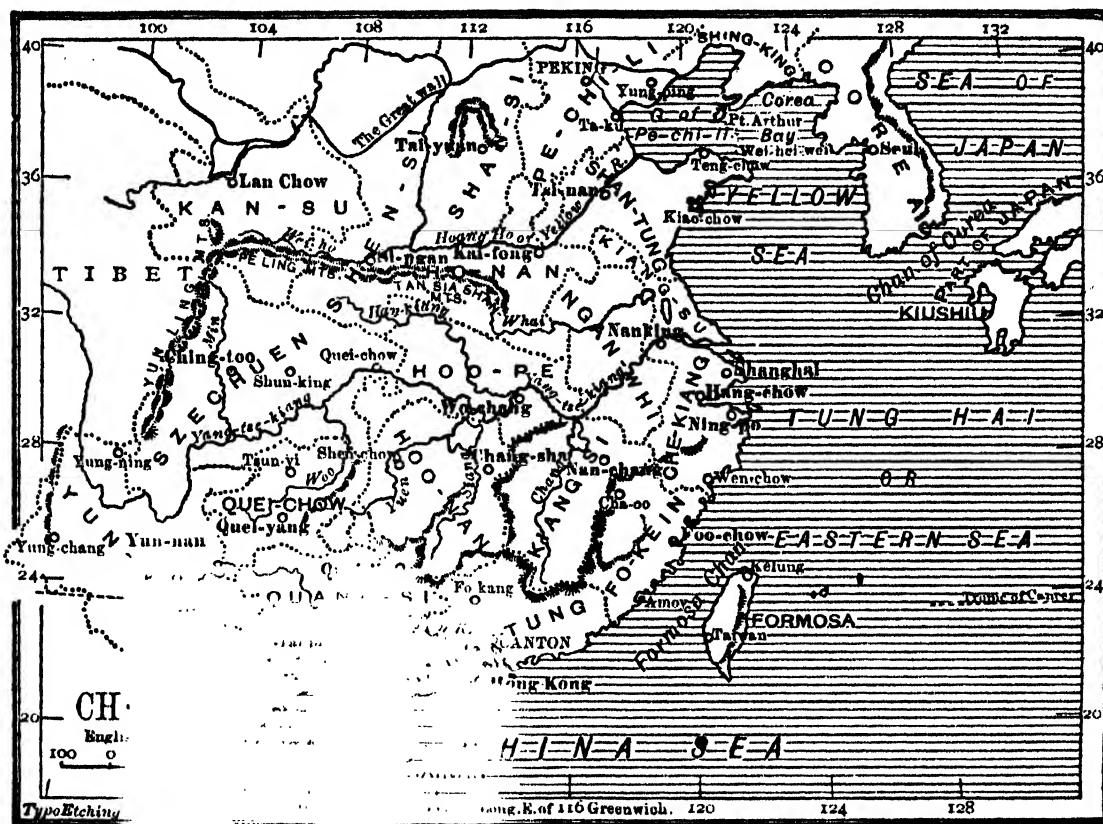
being possibly entitled to generic rank, two seem to be well defined; the Common Chimpanzee (*A. troglodytes*, *Troglodytes niger*) and the Bald-headed Chimpanzee (*A. calvus*, provisionally assumed to be the *T. calvus* of Du Chaillu). The first-named is by far the better known, many species having been exhibited in England from time to time. The body, forehead, and cheeks are covered with long, harsh black hair; the face is a dirty flesh-colour; the chin and upper lip are covered with long white hair; the hands and feet are brownish, and the hair on the rump is white and long. "Sally," the Bald-headed Chimpanzee, which was acquired by the Zoological Society in 1883 and lived in the Gardens for about eight years, is the best known example of the second form, only one other example having been brought alive to this country or indeed to Europe. The chief external marks which differentiate the Bald-headed from the Common Chimpanzee are the scanty covering of hair on the body, the large naked ears standing out nearly at right angles to the head, which is thinly covered with short black hair, and the much darker colour of the skin of the face, ears, and limbs. (*Proceedings of the Zoological Society*, 1885, p. 673; 1889, p. 316; *Nature*, Jan. 10, 1889.)

China, a vast empire in Eastern Asia, consisting of China Proper, Manchuria, Mongolia, and Eastern Turkistan, with the dependency of Tibet.

Geography. China Proper is situated between lat. 42° and 20° N., and long. 122° and 98° E., and covers an area of about 1,348,870 square miles. It is thus about eighteen times as large as Great Britain. It measures 1,474 miles from north to south, and 1,355 miles from east to west. For administrative purposes it is divided into twenty-two provinces, each ruled by a Governor responsible to the Emperor for the entire administration. Every province is sub-divided into prefectures ruled by prefects, and each prefecture into districts, each with a magistrate. The Yangtsze Kiang, the most important river, divides China into two nearly equal parts; and it further forms the boundary between the mountainous and hilly southern portion of the empire and the great plains and uplands of the north. Southward from its bank the country presents a succession of hills and mountain ranges which are broken only by the narrow valleys along which run the roads, or native bridle paths which serve the purposes of land communication throughout the southern provinces. So narrow are these paths that, with the exception of a portion of Yunnan, nothing on wheels can traverse them; the only means of land conveyance being horseback and sedan chairs. On the north, on the contrary, we find a huge delta plain stretching from the Yangtsze to the neighbourhood of Peking, a distance of 700 miles from north to south, and from 150 to 400 miles from east to west. To the westward of this plain, and separated from it by the Peiling Mountains, lie the uplands of Szech'uen, while to the north of that range there stretches away, as far as the Great Wall, a comparatively open country extending over the provinces of Kansuh, Shensi, and Shansi.

The most noteworthy feature of China north of the Yangtze is the vast deposit of loess which covers an area of 250,000 square miles, comprising parts of the provinces of Chihli, Shansi, Shensi, Kansuh, and Honan. This strange deposit, about the origin of which geologists are much divided, covers the ground to the depth, in some places, of 1,000 feet, and gives a uniform yellow tinge to the whole landscape. In substance it is a light, friable soil, and when watered by seasonable rain it is eminently fertile. Its porous structure, however, renders it extremely liable to drought when the rain fails. At such seasons the area it

result is that a constant process of silting-up has been going on for many centuries. To counteract this evil the Chinese, instead of dredging the bed, have done exactly as the Italians have done in similar circumstances with the river Po. They have embanked its borders, and as the silting-up has continued, have laid layer upon layer on the embankments until at the present time the bed of the river is for a considerable part of its course above the level of the surrounding country. The danger of this condition of things is obvious, and is frequently emphasised by the recurrence of disastrous floods which lay waste the whole of



MAP OF CHINA.

covers, which, from the moment they are exposed to the sun by the action of the surface soil, perishes. The plants are helpless against the attacks of the harmful insects of the soil, and the result is the destruction of their crops. The result is that the native pre-occupations and activities of the people are destroyed. The result is that while the people are as busy as ever, they are as poor as ever.

The colour of the Yellow River gives it its name. It is full of loose stones.

Yellow River is the largest river in China. The yellow current, which runs down this river, deposits sand and the

the neighbouring country. An attendant evil resulting from this state of things is that this huge river is for navigable purposes practically valueless. Only light native craft can navigate its waters. The Great Canal also, the work of Kublai Khan, which connects Hangchou Fu in the province of Chékiang with Tientsin in the neighbourhood of Peking, is through portions of its course, partly from the same cause and partly from neglect, in the same useless condition. Neither of these waterways can compare for an instant in importance with the Yangtsze Kiang, which runs a course across China of 2,900 miles, and is navigable by steamers as far up as Ichang, a distance of 963 miles from the mouth. Above this point the stream is disturbed by a succession of rapids formed by the débris of the cliffs which line its course through the mountainous region which separates western China from the Eastern provinces. At certain seasons of the year it is possible that steamers might be able to ascend this broken water, and by

the Chefoo convention the right of running steamers as far up as Chungking in Szech'uen was conceded by the Chinese. By a later agreement, however, Sir John Walsham, the British minister at Peking, resigned this privilege. The southern portion of the empire is abundantly watered, the largest river being the Sikiang, or West river, which, rising in Yunnan, runs through the provinces of Kwangsi and Kwangtung, and empties itself into the China Sea in the neighbourhood of Macao. This river is navigable for vessels not drawing more than 15 feet as far up as Shaoking, a distance from its mouth of 180 miles.

Climate. In such a huge empire as China it is impossible to generalise as to the climate. This will be sufficiently plain when we state that while during the winter months the northern provinces are fast icebound, the ice even extending some distance into the Gulf of Pechili, the thermometer at Canton has never been known by Europeans to fall below 29°, the average temperature in January and February, the coldest months, being from 50° to 60°. It is noticeable, however, that the temperature of the whole empire is lower than that of any country in the same latitude, and judging from the physique of the people and the teeming population, it may be assumed that the climatic conditions are generally favourable. This, also, is in face of the very insanitary conditions in which the people live, and which give rise at times to most destructive epidemics. Of these, cholera is the most common, and at times this terrible scourge more than decimates the populations on the scenes of its ravages. Small-pox is endemic in China, and is as universal among children as measles is among ourselves. In a large proportion of cases the disease proves fatal, but since almost every child suffers from it, it is practically unknown among adults. Fevers, of course, are common; and in the south-western province of Yunnan a strange disease, resembling in some respects the Plague, occasionally desolates whole districts. From the accounts furnished by the Roman Catholic missionaries it seems that the first warning of the approach of the epidemic is a mortality among the rats, which forsake their holes and fall dead on the surface of the ground. Larger animals are next seized, and finally the disease attacks human beings. The symptoms are high fever and the appearance of swellings in the arm-pits and at the back of the neck. As a rule, death occurs in a few hours after seizure.

The *Flora* of China is as wide in its range as the climate is various. At Hongkong, an island which is peculiarly rich in botanical specimens, the flora presents the features of that of tropical Asia, while in the central and northern provinces we recognise the characteristics of the flora of the Himalayan region. Among the most notable trees of China are the bamboo, which grows in all but the most northern provinces of the empire; numerous coniferæ, palms, the willow (the graceful growth of which causes it to be used as a favourite simile by poets for all that is elegant and pliant in form), the oak, chestnut, walnut, and the *eleococca cordata*, which flourishes in Western China, and which is particularly admired for the beauty of its growth

and the hardness of its timber. It is from this wood that the pillars are made which are used to support the roofs of the palace buildings, as well as of all the principal yamens and temples throughout the empire. Of the flowers, the *camellia japonica* is most highly prized by the Chinese. The *ranunculaceæ* stand next in rank, and include eight species of flowering magnolias, the tree peony, or "King of Flowers," as the Chinese call it, various species of clematis, and the lotus. Among the flowers must also be included the poppy, which, while it is admired for its beauty, has a bad reputation as the producer of opium; and the various kinds of azaleas, wild roses, and honeysuckles, which clothe with much beauty the hills in Central China. Of the grains of China, rice is the most important, and is grown in most of the southern and central provinces of the empire, while in the north, wheat, oats, millet, and maize form the staple crops.

Of wild *animals*, tigers, wolves, foxes, monkeys, wild cats, and various kinds of deer, including the musk deer, are the most conspicuous, while the horse, water buffalo, oxen, and dog are domesticated for the service of man.

Among the *products* of China tea, cotton, and silk are the most important, although, so far as the English market is concerned, the amount of tea exported has considerably decreased. Roughly speaking, Chinese tea is to be divided into two kinds, black and green. The best black teas are grown in the provinces of Fuhkien, Hupeh, and Hunan, and the best green teas in the provinces of Chékiang and Ganhwuy to the south of the Yangtze Kiang and west of Ningpo. Rougher kinds are grown in the provinces of Kwangtung and Szech'uen. Silk is produced in every province of China, twenty-seven per cent. of the world's silk supply coming therefrom. The finest kinds are produced in Chékiang, and are known in commerce as *tsatli*, *taysaam*, and *yuenhwa*; next in quality stand those which come from Kwangtung, Szech'uen, and Kiangsu, while coarser kinds come from Shantung and the other provinces. By the introduction of various mechanical devices, the output of silk has been materially increased of late years. The sugar cane is largely cultivated in Kwangtung and Fuhkien, and cotton is grown in most of the central provinces—notably Kiangnan, Honan, Hunan, and Hupeh. Camphor is an important article of export from the island of Formosa, where the growth has until lately been a monopoly. Since this has ceased, the farmers on the mainland are beginning to plant the trees, and no doubt camphor will shortly become one of the principal products of Fuhkien. In Kwangsi the cassia tree is commonly grown, and considerable supplies of rhubarb are produced in Shensi and Szech'uen. Of the manufactured products, porcelain is the most valuable, and the principal seat of the industry is at Kingtiichen in Kiangsi, but this is not by any means the only place where porcelain is made. It is manufactured in thirteen out of the eighteen provinces. In Honan there are as many as thirteen places where it is produced; in both Chékiang and Kiangsi there are eight; and there are five each in

Chihli, Kiangnan, and Shansi. Naturally the principal places are in the neighbourhoods where the chief materials used in the manufactures are found, viz. pih-tun-sze, which is a mixture of felspar and quartz, and kaolin, which is a hydrated silicate of alumina. Lacquer ware and cloisonné wares or enamels are also among the chief artificial products of the empire.

There is probably no country in the world which is so thoroughly cultivated as China. With the most untiring industry every piece of land which is capable of producing anything is carefully tilled, and is compelled to yield its quota towards supplying the wants of the people. With like industry trade is perseveringly fostered, and the results are visible in the garden-like appearance of the country and the crowded and bustling aspect of the cities. On all sides evidences of agricultural industry and commercial enterprise are observable, and it needs but the application of mechanical science to make China one of the richest and most prosperous empires under the sun. The wealth and magnificence, which so astonished Marco Polo when he visited the chief centres of trade, had grown up during many centuries, and have, since the days of the Venetian traveller, made steady and considerable advances. By the establishment of trade with Europe an immense impulse was given to the commerce of China, and at the present time the foreign trade of the country has exceeded the wildest dreams of the most sanguine pioneers of trade at Amoy and Canton. The Portuguese were the first Europeans who gained a footing in China. But their stay in the country was of short duration. And though both the Dutch and British attempted to make settlements on the coast, it was not until the East India Company was established in the seventeenth century in open competition with the Dutch that Europeans were again permitted to trade in commodities with the Chinese. The first factory was established at Canton in 1601, and the trade of 1842 was practically the same as that of 1601. By the year the four additional factories were opened at Ningpo, and Shanghai, and the treaty of Tientsin in 1858, Newchwang, and Swatow, with Chinkiang, and the opening of the Yangtsze Kiang to foreign trade, and the opening of treaty ports. Yet the trade of the country, between the present time and the settlement at Takou on the 19th of October, 1858, and the opening of Mukden, and the trade, and the increase in the trade, and the multiplication of the trade, and the trade of the country, and the trade of 1864 the trade, and the trade of both exports

tael is worth about 5s. 4d.). In 1871 this sum had increased to 136,956,238 taels. In 1881 it amounted to 163,363,851 taels, and in 1906 to 646,726,821 taels. Of the trade represented by these figures the lion's share fell to Great Britain. In the years named the values of the direct trade with Great Britain amounted to 47,978,314 taels, 68,960,954 taels, 46,468,881 taels, and 92,036,607 taels. The trade between China and Hongkong has largely increased. Not to go farther back than 1881, the value of the trade with Hongkong in that year was 48,851,313 taels as against 227,677,384 taels in 1906. This large increase is to be accounted for by the fact that Hongkong has become a *dépôt* to which goods from the treaty ports are shipped, and from which they are distributed to their final destination. Unfortunately the Hongkong returns do not distinguish the trades with the different nationalities, and it is therefore impossible to say what share of the increase of the trade with Hongkong is to be credited to Great Britain. The trade between China and India shows a slight increase, the value of the direct trade with that country being in 1881 27,312,293 taels, and in 1906 34,068,752 taels. This, however, cannot be considered a very satisfactory state of things. While the total volume of trade with China has enormously increased, our share in it has done little more than hold its own. On the other hand, the values of the trade with the other countries of Europe, including Russia, were 16,492,449 taels in 1881, and 96,000,000 taels in 1906. No doubt the competition of the Indian and Ceylon teas has affected both the amount of tea exported to Great Britain and the price that it fetches. On the whole, however, the amount of tea exported from China has not very materially diminished, a fact which is to be accounted for by the increase in the use of China tea both in America and Russia. The export of silk in 1889 was the largest of any one year since the opening of the treaty ports. But here, again, a diminution appears in the amount imported into Great Britain, and an increase in that taken by other countries. No doubt, with an access of energy, our merchants would be able to keep pace with their continental competitors. China has also an extensive coasting and river trade, which, by treaty, is largely carried on by British and other foreign as well as Chinese vessels.

History. If we were to accept the views of the Chinese as to their own history, we should be obliged to believe that their progenitors were created on the soil of China. But we need not put the strain on our credulity. Recent research has shown abundantly that the Chinese came from the region on the south of the Caspian Sea, about the 22nd century before Christ. Within historic and even recent times we have had instances of the migration of whole tribes from one part of Asia to another, and there would be nothing more unusual in the migration of the Chinese from Susiana to China forty centuries ago than there was in the removal of the 600,000 Kalmucks, who, at the end of the 18th century, marched from Russia to the confines of China. It appears certain that the immigrants on approaching China, struck the upper

bend of the Yellow river, and, following its course southward, reached the loess country, of which mention has already been made, and which, after their wanderings through the deserts of Central Asia, appeared to their eyes as a land flowing with milk and honey. But like the Jews of old, they found the country already occupied, and, like the followers of Moses, they were obliged to drive out the inhabitants before them. This they did as much by measures of peace as by weapons of war. Those tribes who accepted their rule were allowed to possess their souls in comfort and to enjoy the privileges to be derived from the higher civilisation which belonged to the intruders. Tribes which were not so amenable were driven out, and wandered gradually southward as the Chinese advanced into the empire. Remnants of these fugitives are still found on the southern and south-western frontiers of China. At the time when Chinese history emerges from fable we find the people settled in the fertile districts of the modern provinces of Shansi and Honan. At this period, and for many centuries afterwards, the empire consisted of a collection of separate states, each of which was ruled over by a king, and over all of which dominated a ruler who was elected from among the kings. During the early state of the settlement in China their system of government appears to have answered well, but by degrees the inevitable jealousies which grew up between the kings led to constant wars and rumours of wars. Such was the state of things in the 6th century B.C., when Confucius attempted to lead the people back to the pristine simplicity of their government and administration. But his admonitions proved fruitless to check the anarchy of the time, and for the next three hundred years the country was given up to constant internecine struggles. At the end of that time (246 B.C.) a sovereign arose who has left his mark on China through all succeeding ages. Chi Hwangti, seeing the necessity of centralising the supreme control, and having the power to do it, abolished the feudal system, which had up to that time existed, and established an empire. To counteract the influence of the writers of antiquity who supported the system he had abolished, he decreed that all books with the exception of those on medicine, agriculture, and divination, should be burned. Fortunately, though he was powerful enough to issue this command, he was not able to have it carried out in its entirety, and, in spite of his ukase, copies of all the works regarded as classics were preserved by the people from this *auto-da-fé*. In opposition to this infamous act of destruction, he executed a constructive work, which is one of the seven wonders of the world, and which will for ever make his name notorious. In order to oppose the inroads into the empire of the Hiungnu Tartars he determined to build the Great Wall along his northern frontier, which still stands as a memento of the first Emperor of China. On the death of Chi Hwangti attempts were made to restore the feudal system, but a successor to the late Emperor arose in Kaoti, who (206 B.C.) founded the dynasty which is known as the earlier Han. With the establishment of peace efforts were made to nullify

the effect of Chi Hwangti's destruction of the books. Scribes were employed to multiply copies of the existing texts, and a great revival of learning succeeded the artificial darkness imposed on the people by the former ruler. From that time onwards the course of the empire has followed the lines then laid down, and though dynasty has succeeded dynasty, though revolutions have disturbed the country, the nation has remained true to its traditions. The principal recognised dynasties which have ruled the land since Chi Hwangti are as follows:—The earlier Han dynasty (B.C. 206–25 A.D.); the late Han (25–220); the Wai (220–280); the Western Tsin (265–317); the Eastern Tsin (317–420); the Sung (420–479); the Ts'i (479–502); the Liang (502–557); the Ch'in (557–589); the Sui (589–618); the T'ang (618–907); the later Liang (907–923); the late T'ang (923–936); the late Tsin (936–947); the later Han (947–951); the later Chow (951–960); the Sung (960–1127); the Southern Sung (1127–1280); the Yuen (1280–1368); the Ming (1368–1644); the Ts'ing (1644, still ruling. During the political confusion which preceded the fall of the Ming dynasty the Manchus were invited to restore order. This they readily undertook to do, but when they had accomplished their mission they refused to retire across the frontier. In accordance with this decision they put their own sovereign on the throne, who ruled as Shunti, the first Emperor of the Ts'ing dynasty. Three of the first emperors of this line, Shunti, K'anghi, and K'ienlung, were all men of great ability, and succeeded in firmly establishing their rule over the people. During the 19th century several wars and rebellions threatened the overthrow of the Manchus. In 1895 China engaged in a war with Japan, which resulted in her complete defeat, the cession of the Liao-Tung peninsula, payment of an indemnity, and the declaration of independence of Korea. In 1898 the cession to Germany of Kiaochow, to Russia of Port Arthur, and to England of Wei-hei-Wei, seemed to indicate signs of a break-up of the Chinese Empire. In 1900 a rising of the Boxers, countenanced by those in authority, took place, and an attack upon the European Legations in Peking followed. This was repulsed, and the allied troops entered the capital, the Emperor and Dowager Empress fleeing the city. Protracted peace negotiations followed, the allies finally withdrawing in 1901. The Chinese Government was compelled to pay an indemnity, and in 1902 the Court returned to Peking. An Imperial decree in 1906, promising constitutional government, still remains in abeyance. The Dowager Empress and also the Emperor Tsai-t'ien died in November, 1908, a two-year-old nephew, P'u-yi, succeeding to the throne.

The Chinese describe themselves as being followers of three religions or sects: viz. Confucianism, or the religion of scholars, Buddhism and Taoism. Confucianism, which holds first place, is simply a standard of ethics between man and man with no mention of a deity. Confucius taught that no future rewards were offered, nor was there a future punishment. The nature implanted by heaven in every man was perfectly good,

and he held that by keeping this uncontaminated from evil and by following its dictates men might be enabled to reach perfection, and to become "the equal of heaven." A careful observance of the rules of propriety and of general conduct was, he considered, the right way of leading men to this much-to-be-desired consummation. Such were the leading doctrines of Confucius as taught by the sage. As time advanced they became overlaid with the subtleties of the schools, and by the superstitious beliefs which have corrupted the religion of Buddha and the philosophy of Laotsze, the founder of Taoism. It is uncertain when Buddhism was first introduced into China; but it appears probable that the first tidings of it reached that country from India during the reign of Mingti (A.D. 58-76). It was during that reign, we are told, that the first Indian missionary arrived at Loyang, which was then the capital of the empire. This pioneer was speedily followed by others, who brought to the knowledge of the Chinese the Mahâyâna system, which was the outcome of the change which the religion had undergone in India. Under this system Nirvâna had, as a reward for virtue, been supplemented by "the pure land in the west," which was to be the blissful abode of all those who worshipped Buddha and worked righteousness. This more material conception of the faith recommended itself to the practically-minded Chinese, who have again supplemented it by the invention of a Pantheon of deities. Like Buddhism, Taoism in the shape of Buddhism had its origin in India. Like Brahma, the *Tao*, which Laotsze preached, was the mother of all things. All things originated from it, and to it at last returned. It was to enable men to have free scope to the unconfined in them, to attain to subtleties were unsuited to the Chinese, and speedily reduced them to a more practical and sought in elixirs themselves a prolongation of life, and presented the *summum bonum* by Laotsze. Like Buddhism, it later development degenerated into idolatry. Thus these religions, with their supernatural elements, were merged into Confucianism, and formed a system which is one of the largest, few of the more actively any.

The government is a despotic one, and the people, who are obedient to the ruler. A departure from the justifies the the administration assisted by a council—established or Senate—has one exception of

Wai-Wu-Pu)—which has a Comptroller-General and two presidents—and the Boards of War and Education, which each has a Comptroller-General in addition to the president. Each of the twenty-two provinces is ruled by a Viceroy placed over one, two or three provinces, or by a Governor over a single province, either under a Viceroy or depending directly on the central government; the Viceroy or Governor being responsible to the Emperor for the entire administration, political, judicial, military and fiscal. Each province is subdivided into prefectures ruled by prefects, and each prefecture into districts, each district with a magistrate.

The civilised *inhabitants* of China, as distinguished from the surrounding Miao-tse wild tribes, are now supposed to be comparatively recent intruders in the Hoang-ho and Yang-tsze basins, where the primitive Bak tribes arrived from the west or north-west, probably not more than 5,000 years ago. Before the immigration they appear to have been long in contact with the civilised Accado-Semitic populations of Mesopotamia. Hence they reached China already a somewhat cultured people with a knowledge of letters, astronomy, and various arts. The Baks, like the Accads themselves, were doubtless of Mongolic stock, and in their new homes they intermingled with the aborigines, who were chiefly Shans, also of Mongolic stock. Hence the essentially Mongolic and somewhat homogeneous character of the present Chinese populations, whose nationality can always be detected at the first glance; hence, also, the stagnant nature of their civilisation, for the Mongol, as compared with the European, is distinctly unprogressive. In the early period of their history they developed the arts and sciences which they had brought with them to a limited extent; but since then they have mostly remained at a standstill, and even now find the greatest difficulty in assimilating Western ideas. Their astronomy is still almost in the astrological state; their religion is a system of cold moral precepts, combined with ancestry and spirit (demon) worship; their medical art is a hopeless mixture of superstitious practices, nostrums, and a little common sense. Physically the Chinese are below the middle height, averaging about 5 feet 4 or 5 inches, with somewhat coarse thick-set frames, prominent cheek bones, oblique eyes, small nose, broad flat features, yellowish complexion, long lank black hair, sparse or no beard, inanimate expression, with great staying power and capacity for enduring fatigue and hardships on poor fare; they are naturally frugal, thrifty, and parsimonious, though given to reckless gambling, excessively courteous among themselves, but rude and aggressive towards strangers, with a deeply-rooted feeling of contempt and even hatred of foreigners and all their ways. A characteristic trait is their excessive gregariousness, shown in the tendency to crowd together in large villages and cities, so that small hamlets and scattered farmsteads are scarcely anywhere seen in China. In San Francisco 10,000 Chinese are packed together in a space where 1,000 whites would be asphyxiated. This again leads to other evils, and especially to a low state of morals,

which is perhaps the chief objection to the free admittance of Chinese immigrants in European colonies. Emigration has hitherto been directed mainly to the Eastern Archipelago, Indo-China, and the Malay Peninsula, where the Chinese labourers compete successfully with the indolent native populations. The national name is *Chung-kûe-jin*, "people of the middle kingdom," where *Jin* (people, men) appears to belong to the same root as *Chin*, China, already occurring in Sanscrit writings, and known to the ancients in the form of *Sina* through the old Persian *Sin*. Exaggerated statements have long been current regarding the population of China, which has been estimated as high as 500 or even 600 millions. No real census has ever been taken, but estimates have been made, based on official data, showing 414 millions for 1842, 420 millions for 1852, and 407 millions for 1902. Kreitner, who studied the question on the spot, regarded these figures as much too high, and reduced them to about 150,000,000. Other unofficial calculations give 350 and 280 millions, and an impression now prevails that the population of China is about the same as that of British India in its widest sense, say 300,000,000. For the uncivilised non-Chinese populations see MIAO-TSE.

China Aster (*Callistephus chinensis*), an annual composite plant, a native of China, with an erect branched stem, scattered, sessile, toothed leaves, and large showy terminal heads of strap-shaped or tubular florets, white, pink or violet in colour. Each head has several rows of spreading leafy bracts with lobed margins and a slightly convex receptacle. Being hardy, free-flowering, and showy, the plant has become a favourite with gardeners.

China Sea, the portion of the Pacific bounded on the N. by Formosa, N.W. by China, W. by Anam and the Malay Peninsula, S.E. by Borneo, and E. by the Philippine islands, is divided into the three parts—Yellow Sea, Eastern China Sea, and Southern China Sea. It is subject to typhoons, and haunted by pirates. It is also full of islands.

Chinch Bug, a small North American bug (*Blissus leucopterus*), which does enormous damage to corn crops. It belongs to the order HETEROPTERA.

Chinchilla, a name for two genera of South American rodents, forming, with the Viscachas, the family Chinchillidæ. The true Chinchillas (*Chinchilla lanigera* and *C. brevicaudata*), from the Andes of Chili and Peru, are active squirrel-like animals, with silvery grey fur marbled and tinged with black. This fur is in much request, and to obtain it thousands of these rodents are trapped every year. The Alpine Chinchillas (*Lagidium cuvieri* and *L. pallipes*) are much larger; they resemble the hare in form, and the fur is ash-grey. The last-named species has a more northerly range than any of the others. [VISCACHA.]

Chindwara, a town of India in the central provinces, and capital of a district of the same name, is situated at an altitude of 2,200 feet and is a European health resort. The district covers an area of nearly 4,000 square miles.

Chinese Language, the most important member of the Isolating group, the other chief members of which are Tibetan, Annamese, Shan (Siamese, Lao), Burmese, and all other Indo-Chinese tongues, except Cham and Khmer (Cambodian). These languages are commonly called monosyllabic, and till recently it was supposed that they consisted exclusively of monosyllables, thus representing the most primitive and least developed type of human speech. Now it is known that monosyllabism is not a primitive, but an advanced state, resulting from profound phonetic decay, of which Chinese and its congeners afford the clearest evidence. Thus the Chinese *i* = "doubt" was originally *tadaka*, a word of three syllables; and so with the whole language, which by this process of decay has been reduced to a limited number (about 1,600) of monosyllables wrongly called roots, whole groups of which necessarily resemble each other in sound, but are distinguished chiefly by their intonation. To understand this let a group of five words, such as *baka*, *bada*, *bama*, *basa*, *bafa*, be all worn down to *bak*, *bad*, *bam*, *bas*, *baf*, and finally to the single sound *ba*; it then becomes obvious that this *ba* must have five different meanings, which, in the spoken language, could not be distinguished unless uttered with five corresponding tones. Thus tone, introduced to distinguish the meaning of countless homophones, becomes an all-important feature, and it would be better to call these languages *tonic* than monosyllabic. They are, however, correctly enough called isolating, because each word stands apart (isolated) in the sentence, in which its relation to the other words is determined, not by inflection or change of form, of which it is incapable, but by its position, as in such English sentences as John strikes James, James strikes John. Hence, in Chinese, almost everything depends on tone and position, beyond which there is little grammar or syntax. There are other expedients for distinguishing homophones, the most important being the juxtaposition of two synonyms, one fixing the sense of the other, as if the English word *road* were distinguished from its homophone *rode* by the addition of *way* (road-way). Such compounds are frequent in Chinese; but the process is clumsy compared with the tonic system, which has accordingly acquired an immense development in all the isolating languages. In the standard Mandarin language, as it is called, there are five tones, which are really insufficient, and hence are largely supplemented in the numerous provincial dialects. Some have as many as twelve or fourteen, which Europeans have the greatest difficulty in mastering, and as the least mistake in a tone causes misunderstanding, Chinese is little used for international intercourse. In the free ports it has been replaced by the so-called "pigeon English," i.e. "business English," a kind of jargon or *lingua franca*, in which most of the words are English and the form of expression Chinese.

Chinese is written in what are called "hieroglyphics," a better name for which would be "ideographs." They are symbols not of sounds, but of ideas; hence each character represents a

Chintz is a glazed cotton cloth with various colours and patterns on a plain ground. It is used for ornamental hangings, especially fitted hangings, and does not last long. The substance is of cheap material and is made in India, which is why it is called chintz. It is a very popular material for home decoration.

Chippewayans, a North American people, forming the central and most important division of

the widespread Athabascan family. [ATHABASCANS.] Their domain extends in all directions round Lake Athabasca, where the Hudson Bay Company's Fort Chippewayan is their chief meeting-place. They are of a quiet, inoffensive disposition, and most of them are employed by the company as trappers, carriers, and in other capacities. Chippewayan, which in Algonquin means "pointed coat," is the name given them by their Cree neighbours; but they call themselves Tinney, i.e. "Men" in the Athabascan language. Their tribal divisions are very numerous, and the so-called Beavers, Dogribs, Strongbows, Sheep, Red Knives, Hares, Slaves, Brushwood, and Horn Mountains, are all Chippewayans; in fact, all the tribes between the Rocky Mountains and Hudson Bay, as far south as the Churchill river and Methy portage, are members of this group.

Chippeways (Ojibways), a large Algonquin nation of Upper Canada and Michigan, forming, with the Crees, Montagnais of Labrador, and a few others, Schoolcraft's Nipercinean (fourth) branch of the Algonquin family. The Chippeways, who still number about 12,000, have all abandoned the chase, and have in other respects largely conformed to civilised ways. They are chiefly occupied with agriculture, and support a number of schools, where both Chippeway and English are taught.

Chiquinquira, the large town of the department of Boyaca, Colombia, South America, near the river Suarez, and 30 miles from the capital, Tunja. In primitive times it was a spot venerated by the natives, and the Spanish invaders discovered there a miraculous image of the Virgin, which to this day attracts every year thousands of pilgrims.

Chiretta, an infusion and tincture included in the British Pharmacopœia. It is an aromatic bitter, very similar in its action to gentian. It is compatible with iron, and the chiretta preparations are sometimes prescribed in such combination. It is prepared from *Ophelia chirata*, a gentianaceous plant of India.

Chiriguanos, a large South American nation, forming an important branch of the great Guarani family [GUARANI]; they inhabit the plains west of Gran Chaco, near the foothills of the Western Andes, between the Pilcomayo and Vermejo affluents of the Paraguay river. The Chiriguanos take a conspicuous place in the records of the early Spanish settlers, and they are still practically independent of the Argentine government. They are a fine, manly race, tall and well-proportioned, of a light coppery complexion, with dark eyes and very long black hair. They have attained a relatively high degree of civilisation. Their women are described by M. de Moussy as the most courteous and agreeable of all native women (*Description de la Confédération Argentine*, vol. ii. p. 184).

Chirimoya, or CHERIMOYER (*Anona Cherimolia*), a fruit native to Ecuador, closely related to the sweet and sour sop and custard apple of the West Indies, and considered by Creoles the most

delicious fruit in the world. It is heart-shaped and scaly externally.

Chiriqui, the name of a province, a river, a lagoon, an archipelago, and a volcano in the state of Costa Rica, Central America. The province extends from coast to coast across the isthmus, and has an area of about 4,000 square miles. The river flows from S. to N., and enters the lagoon, which stretches for 90 miles along the coast, and affords anchorage for the largest vessels, being shut in from the Caribbean Sea by the archipelago. The volcano is situated in the W. of the province.

Chirograph, an instrument of gift or conveyance attested by the subscriptions and crosses of the witnesses. Anciently the chirograph was engrossed twice on one piece of parchment, contrariwise, leaving a space between in which was written in large words "Chirograph," and then the parchment was cut in two through the middle of the word, and a part given to each party. The first use of chirographs was in Henry III.'s time.

Chiron, according to Greek legend, was one of the Centaurs, the son of Chronos and Philyra. He lived in a cave under Mount Pelion, and was renowned for his skill as an archer and a musician, but still more so for his knowledge of the healing art. He was the instructor of Achilles, Hercules, Æsculapius, Ulysses, Nestor, and many others. Having received an incurable wound in the knee from a poisoned arrow shot by Hercules, he begged Zeus to relieve him of his painful immortality, which was conferred on Prometheus, he himself being translated to the stars as Sagittarius.

Chiroptera. [BAT.]

Chiru (*Panthalops hodgsoni*), a gregarious antelope from the highlands of Western Thibet and, perhaps, Turkestan. It is about three feet high at the shoulder, reddish fawn above, and white below, the nose and face are black, and there is a dark band down the front of each leg.

Chislehurst, an extensive parish and village in the county of Kent, 9 miles S.E. of London. Occupying with its offshoot West Chislehurst the picturesque slopes that culminate in a broad common 300 feet above the sea-level, the locality has become of late years a favourite residence for the better class of City men, and numbers of handsome villas have sprung up in the neighbourhood. Camden House, close to the common, afforded a refuge to Napoleon III. after his fall in 1870, and here he died in 1873. Pop. (1901), 7,429.

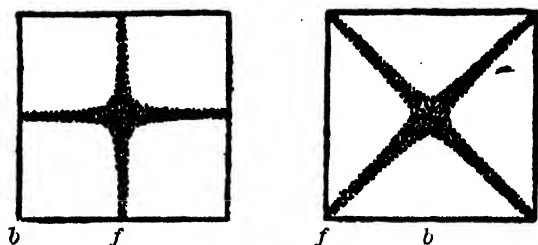
Chiswick, a village in Middlesex, standing on the N. bank of the Thames, 4½ miles from Hyde Park Corner, on the South Western and District Railways. The neighbourhood has always been celebrated for gardens and orchards, the Royal Horticultural Society formerly being established there. Chiswick House, the seat of the Duke of Devonshire, where Fox died in 1806, and Canning in 1827, is chief among the many handsome suburban residences that were built here in the 19th century, but the ground is rapidly becoming covered by

Chive (*Allium Schaenoprasum*), a British species of onion with small slender bulbs and dense tufts of thread-like, awl-shaped leaves, six or eight inches

long, largely grown in Scotland as a spring salad or seasoning for soups.

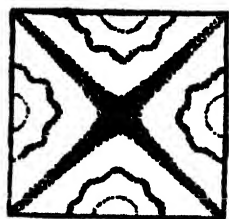
Chladni, ERNST FLORENS FRIEDRICH, was born at Wittenberg in 1756. Brought up as a lawyer, he devoted much attention to music, and having a knowledge of mathematics and physics, was led to investigate the theory of sound. He discovered the laws of vibration, and was the first to notice the figures formed by fine sand on a sheet of glass in response to the vibrations of a violin bow. He also invented the euphone and the clavi-cylinder. His scientific works were numerous, the principal being his *Discoveries on the Theory of Sound* (1787) and his *Treatise on Acoustics* (1802). He also wrote on meteors. His death took place at Breslau in 1827.

Chladni Figures, in *Acoustics*, a convenient method of illustrating the vibration of plates or membranes. If a square brass plate be clamped in a horizontal position at its mid-point, and be



CHLADNI FIGURES.

covered with a thin layer of fine sand, its vibrations under varying conditions may be exhibited by the disposition of the sand, the particles being shaken from the vibrating parts of the surface on to the non-vibrating parts or *nodes*. Vibration of the plate is usually induced by drawing a well-resined bow across any definite point on the edge of the plate. The positions of the nodes are varied by placing one's finger at various points round the edge. In the sketch the plate is supposed to be bowed at *b*, and the fingers applied at *f*. The sand is shown at the nodal lines. If lycopodium powder be used instead of sand, it will accumulate at the middle of each vibrating segment instead of at the nodes. This is due to the disturbance of the air in the immediate neighbourhood of the plate, and to the lightness of the powder.



CHLADNI FIGURES.

Chlamyphorus, a genus of Edentate Mammals, with two species, closely allied to the Armadillo (q.v.). *C. truncoatus*, the Pichiciago, from La Plata, is about six inches long, and mole-like in habit. The armour, which is only attached to the back immediately over the spine, consists of twenty-four leathery bands, composed of geometrical plates or scales, and the lower edges are fringed with silky hair. The eyes, ears, and mouth are small, and the latter is furnished with eight molars on each side, above and below. In *C. retusa*, a somewhat larger form from Bolivia, the armour is adherent over the

whole of the back. In both the hind parts are protected by armour, and the under surface is covered with long hair.

Chlamydosaurus, a genus of Iguanidae, with one species (*C. kingii*), from Australia. "It has a curious membrane like a ruff or tippet round its neck, covering its shoulders, and when this is expanded . . . it spreads five inches in the form of an open umbrella."

Chlamys, a short, light mantle in use among the ancient Greeks, and adopted to some extent by the Romans. In form it had three straight sides, and one curved, and was generally arranged with the two squared sides brought together on the shoulder and fastened by a brooch. Ancient statues and carvings show many different modes of letting the folds hang.

Chlopicki, JOSEPH, was born in Galicia or Podolia in 1772, and entered the French army about 1796, rising to the rank of General. He took an active part in the Russian campaign of 1812. After the fall of Napoleon he transferred his services for a short time to Russia, but soon retired. In 1830 he was chosen Dictator by the revolutionary Poles, but his want of impetuosity displeased his colleagues, and at the end of a few weeks he resigned. He then served in the ranks, and was wounded. He survived until 1854.

Chloral, a colourless pungent liquid, boiling at 99.6°, sp. gr. 1.5, was first prepared by Liebig by passing chlorine gas into absolute alcohol. In composition it is closely allied to aldehyde, consisting of trichloraldehyde, CCl_3CHO . With water it forms a compound *chloral hydrate*, $\text{CCl}_3\text{CHO} + \text{OH}_2$, which crystallises in small tablets of the monoclinic system. Chloral is a rapid and powerful hypnotic, and while far inferior to opium in that it does not relieve pain, its employment is admissible in some cases where opium is contra-indicated. Its action is distinctly depressant, and it requires to be used with great caution; in patients suffering from organic disease of the heart, lungs, or kidneys, its administration may be attended with danger. The chloral habit is acquired by those who repeatedly have recourse to the drug for its sleep-giving properties; this condition is less common than the analogous morphia habit. The fact that it does occasionally occur is unquestionable. It is consequently extremely undesirable to administer chloral as a matter of routine in the treatment of sleeplessness. In chloral poisoning there is deep narcosis, accompanied by coldness of the skin, especially of the extremities. In the treatment of such cases loss of heat should be prevented by enveloping the patient in warm blankets; constant efforts should be made to rouse him, as in the case of opium poisoning; warm coffee is valuable for its stimulant action. The syrup of chloral of the British Pharmacopoeia contains 10 grains of chloral in 1 fluid drachm, which is an average dose for an adult. A mixture of equal parts of chloral and camphor is valuable as a local application in certain forms of toothache.

Chlorates are the salts of chloric acid, HClO_3 . The acid itself is a colourless liquid which can only be obtained in solution. It is a powerful oxidiser, and organic bodies at once decompose it. The salts are all soluble in water. Potassium chlorate is the most important. This salt crystallises in large monoclinic tablets, which emit light if rubbed. It is prepared by passing chlorine through a warm solution of caustic potash, the reaction being represented by the equation



The chlorate is separated from the potassium chloride, also formed by crystallising. Other chlorates are prepared in a similar manner. Potassium chlorate is used for the preparation of oxygen gas, as an oxidiser, and in pyrotechny. It is also employed in calico printing, and in the manufacture of safety matches. It is used for medicinal purposes, and chlorate of potash lozenges are largely sold for relieving inflammation of the throat.

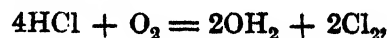
Chlorides are the salts of hydrochloric acid, HCl , and may be represented by the formula MCl where M is a monobasic element. They are generally formed by dissolving the metal or its oxide in the acid. Many may be prepared by direct union of the metal and the gas. Thus antimony takes fire if sifted into chlorine gas forming the chloride SbCl_3 . With the exception of lead, silver, and mercurous chlorides (PbCl_2 , AgCl and HgCl) they are all soluble in water. Many of them are very important commercially or chemically. Ordinary common salt consists of sodium chloride, NaCl . Calcium chloride, CaCl_2 , is largely employed for drying gases, and is an invaluable chemical reagent. It is used as a desiccant in the preparation of anhydrous acids, and its solution forms the basis of many chemical processes. Chloride of gold, AuCl_3 , is used in photography, and platinum chloride, PtCl_4 , in chemical analysis. The trichlorides of iron, FeCl_3 , and mercury, HgCl_2 , known as corrosive sublimate, are used in medicine. Ammonium chloride, NH_4Cl , the sal-ammoniac of commerce, is prepared by heating a solution of chlorine with non-metallic substances. The chlorides of the metals are also called chlorides. Ethyl chloride, $\text{C}_2\text{H}_5\text{Cl}$, is a gas at the theoretical boiling point, and is of great importance.

Chlorine is present in the atmosphere of the earth. Most chlorides are soluble in water, and a known case with the method of liberation by the use of cubic centimetre of chlorine gas.

Chlorine (Cl , atomic weight 35.37), a gaseous element which does not occur free in nature, but, combined with other elements, occurs largely in sea water, and beds of mineral salts. It is chiefly prepared by the action of hydrochloric acid on manganese dioxide,



It is also largely prepared by passing hydrochloric acid gas and air over heated bricks impregnated with copper sulphate,



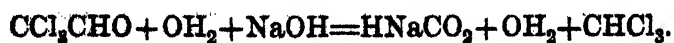
the copper sulphate undergoing no change (Deacon's process). It is a greenish gas (hence its name *chlōros* = green) with a very disagreeable suffocating smell. When strong it is a violent irritant, causing inflammation of the mucous membrane of the throat. By pressure and cold it can be condensed to a yellow liquid. It is soluble in water, but is evolved on warming the solution. Many metals burn in chlorine, and it acts energetically on many organic substances containing hydrogen. When moist it possesses the power of bleaching vegetable colours, but the dry gas has not this property. It has also antiseptic properties, which, like the bleaching, appear to depend on its oxidising power. It is largely used for the preparation of bleaching powder and other manufacturing purposes, and its solution is much employed in the chemical laboratory. Together with bromine, iodine, and fluorine, it constitutes the group of elements known as the Halogens (q.v.).

Chlorite, a hydrous silicate of magnesium, aluminium, and iron, forming a dark olive-green, nearly opaque, pearly mineral of common occurrence. It crystallises in the hexagonal system in non-elastic laminae, and forms the bulk of the rock *chlorite-schist*. It fuses with difficulty, but gives off water, and is far softer than hornblende. Hardness = 1.5; specific gravity = 2.6 to 2.8. Chlorite is essentially an alteration-product in rocks of igneous origin. [METAMORPHISM.]

Chlorodyne, a patent medicine which has acquired a reputation mainly as an astringent and hypnotic. Its composition is practically the same as that of the *tinctura chloroformi et morphinae* of the British Pharmacopœia. The dose is 5 to 10 minims for an adult. Both these preparations contain very powerful ingredients, and must be used with caution.

Chloroform, a colourless mobile liquid, boiling at 62° . It was discovered by Liebig in 1831, and is generally prepared by distilling a mixture of bleaching powder, water, and alcohol, and purifying the crude product. The mixture is warmed in a large still until the chloroform begins to distil over, and the action continues without further application of heat. The composition is represented by CCl_3H . In England "methylated spirit" (alcohol containing 10 per cent. wood naphtha) is largely used for its preparation, owing to the high duty on absolute alcohol. The product is known as "methylated chloroform," and does not appear to differ from that prepared from pure

spirits. It may be obtained in a state of purity by the action of caustic soda on chloral hydrate,



It has a sweet taste; taken internally it acts as a stimulant, and the inhalation of the vapour produces anæsthesia. It is hence largely used medicinally, and in surgical operations. It is also employed as a solvent for caoutchouc and many organic substances which are insoluble in water, alcohol, and the ordinary solvents. For the use of this drug as an anæsthetic, see ANÆSTHESIA. The following preparations of chloroform are included in the British Pharmacopœia:—*Aqua chloroformi*, dose 1 fluid ounce; *linimentum chloroformi* useful as a local anæsthetic; *spiritus chloroformi*, dose $\frac{1}{2}$ to 1 fl. drachm; *tinctoria chloroformico*, dose 10 to 30 minims, and *tinctoria chloroformi et morphinæ*, dose 5 to 10 minims. The *aqua*, *spiritus*, and compound tincture are mainly used in combination with other drugs in the treatment of dyspeptic conditions. The *tinctoria chloroformi et morphinæ* is useful in certain forms of diarrhœa, and as a hypnotic.

Chlorophyll, the green colouring matter of the leaves and young stems of plants, a substance of great physiological importance. In the lowest algæ, such as the *Protococcaceæ* and the "gonidia" of lichens, it exists diffused throughout the protoplasm. In *Spirogyra* it colours spiral bands of the protoplasm only; in *Zygnema*, stellate masses; and in other *Conjugatæ*, portions of other forms; but in higher plants (exclusive of all fungi and of a few parasites and saprophytes among flowering-plants in which it is absent) it colours certain differentiated granules of the protoplasm known as *chloroplastids*. These are formed independently of the action of light; and in the leaves of ferns and the cotyledons of gymnosperms, if the temperature be high enough, they become green in the absence of light. Normally, however, *i.e.* among angiosperms, they are either colourless (in the absence of iron) or coloured yellow by *etioline* (in its presence) until exposed to light. For the development of their green colour they require (1) light of moderate intensity, especially the yellow end of the spectrum, (2) heat, approximating to an *optimum* temperature between 25° and 30° C., and (3) iron. The chemical composition of chlorophyll is not certainly ascertained, but it contains carbon, hydrogen, nitrogen, oxygen, and perhaps phosphorus and iron. It is insoluble in water, but in alcohol, ether, or benzol yields a bright green solution having a brilliant red fluorescence (q.v.). It gives an absorption spectrum with seven bands, four narrow between the red and the green and three wide ones at the blue end. Many observers consider this spectrum to indicate two distinct colouring-matters, one yellow and the other blue-green. In the absence of iron the green colour is not produced, but it is quickly assumed on the plant being watered with a solution of iron. Chlorophyll-granules multiply by division, and seem interchangeable with the colourless *leucoplastids* formed in the dark, and with the variously-coloured *chromoplastids* of ripening

fruits, which contain various crystalline colouring-substances. Chloroplastids are few in number in the epidermis, but occur especially in the "palisade-tissue," or hypoderm of the leaf, and in the *phellogen*, a layer of the primary cortex of the stem. The function of chlorophyll is to bring about the decomposition of the carbon-dioxide of the air absorbed by the plant, liberating an equal bulk of oxygen to that in the absorbed carbon-dioxide. This process, known to vegetable physiologists as "assimilation," is also termed the *chlorophyllian process*, and, as the source of practically all the carbon in the organic world, is a nutritive process (not respiratory) of primary importance. This process only goes on in the presence of light, preferably the less refrangible rays. It is believed to consist in the formation of a glucose from the carbon-dioxide and the water taken in by the roots, the first visible result of it being the appearance in the chloroplastids of starch-grains which may originate from the glucose or grape-sugar by dehydration. [STARCH.] It is by the oxygen liberated in this process that green plants in daylight purify the air. Some protozoa, the freshwater sponge, *Hydra viridis*, and some planarian worms form chlorophyll-corpuscles in their protoplasm, and are thus capable of feeding upon atmospheric carbon-dioxide, or, as it has been called, of *aërobiosis*, *holophytic* or *autophytic* nutrition, as if they were plants.

Chlorosis. 1. A serious constitutional defect, to which many different kinds of plants are liable. It consists in an absence of chlorophyll, a consequent pallid hue, and general weakness. It may occur in plants growing in abundant light, and seems most common in badly-drained soil and in cold, damp weather. It may arise from a deficiency of iron or potash, or from the attacks of moulds. [VARIEGATION.] The term has also been applied to the abnormal replacement of floral by green leaves, of which "green roses" are the most familiar instance.

2. CHLOROSIS, or "green sickness" (Gk. *chlōros*, green), is a form of anæmia or bloodlessness affecting young girls at the time of puberty. In cases of marked chlorosis there is a considerable diminution in the amount of the red colouring matter of the blood (hæmoglobin). The natural ruddy aspect of the countenance in health gives place to a wax-like pallor; the lips, gums, and conjunctivæ are unusually pale, and in extreme instances the face presents a distinctly greenish hue. Hæmoglobin (q.v.) is the great oxygen carrier of the blood. Hence deficiency of hæmoglobin, besides manifesting itself in the altered appearance of the patient, causes imperfect aëration of the tissues, and produces breathlessness. Again, an anæmic condition of the brain is well known to be one of the causes of headache; and thus the three cardinal symptoms of chlorosis (*viz.* pallor, shortness of breath, and headache) are all directly traceable to the altered condition of the blood. Other symptoms are frequently associated with the three already named. Dyspeptic troubles are common, and the occasional association of ulcer of the stomach with chlorosis

gives them considerable importance. Apart from the pain after food, vomiting, and hæmatemesis of gastric ulcer, it is, however, common for chlorotic girls to suffer from flatulence, loss of appetite, and constipation. Neuralgia is of frequent occurrence. Anasarca may be present in slight degree. The menstrual functions are generally disturbed. The monthly flow is commonly absent, but it may be excessive, and there is not unfrequently leucorrhœa. Auscultation of the heart frequently reveals a systolic murmur over the left base, and the pressure of the stethoscope on the veins of the right side of the neck usually readily evokes a peculiar continuous noise, known as the *bruit de diable*. Loss of flesh is for the most part conspicuous by its absence, but there is always impairment of energy and depression of spirits, and sometimes a markedly hysterical condition may be developed. The cause of the disease is obscure. Hæmoglobin contains iron, and the administration of iron in large doses is almost always followed by rapid recovery from chlorosis. Beyond this nothing certain can be said. As regards conditions predisposing to chlorosis, the subjects of the disease are young women usually between 15 and 25 years of age; the immense majority of them work for long hours in a confined and ill-ventilated atmosphere, their food is often deficient in quantity or quality or both, and they almost invariably suffer from obstinate constipation. The treatment of the disease is, almost without exception, most satisfactory, provided the patient can carry out the directions given to her. Pure air, good food, the regulation of the action of the bowels, and the administration of iron in large doses; these things granted, the recovery of the patient proceeds rapidly. Many girls are so habituated to their condition that they resist with horror; and, in such cases, any sort of regularity in the action of the bowels, or the use of aperients, must be made to obtain compliance with ordinary particulars. When the subnitrate of iron is administered, the aperient is generally a mild combination is afforded by the use of the *mixtura ferri compositum*. Iron may be given in the form of Bland's pill; and rectified iron and ammoniac are often successful.

Chloris, a genus of small Australian Marsupials, with a single species, *C. castanotis*. The slender fore-limbs end in two digits, whence the animal is sometimes called the Pig-footed Perameles. [BANDICOOT.]

Choirs, a word generally used to signify organised bodies of church singers, but of late years considerably enlarged, as for example the Bach choir. Also, the part of a church at the east end in which the singers are seated. The efficiency of a choir depends upon many conditions, the chief being, 1st, that the voices be equally balanced; 2nd, that the volume of voice and position of the singers be adapted to the size and form of the building in which they fulfil their functions; 3rd, that the different members have a perfect aptitude for observing time and rhythm, 4th, that they be able to sing at sight; and lastly, though by no means a least necessary condition, that they have much practice together. In most choirs there

success, and was regarded as one of the ablest speakers in America. In 1858 his health broke down, and he died very suddenly at Halifax, whither he had gone on his way to Europe. His nephew, J. H. Choate, b. 1832, was ambassador to England from 1898-1905.

Chobi, a large Bantu nation, Gazaland, South Africa, of whom there are two divisions, the Chobi proper ("Bowmen"), along the left bank of the Lower Limpopo, and the Mindongs, or Northern Chobi of the Inhambane coast district. The former have been reduced by the Zulu invaders of Gazaland. These Mindongs are the *boa gente* ("good folk") spoken of by Vasco da Gama (1498). They disfigure themselves with three rows of warty excrescences on the face; one running from the forehead to the tip of the nose, the others in concentric circles from ear to ear by the upper lip and chin. A similar system of tattooing prevails amongst the neighbouring Transvaal tribes, whence the term Knob-noses applied by the English to all this group of aborigines.

Chocolate, a kind of paste formed by crushing and rolling very fine with water the seeds of the *Theobroma cacao*. These seeds or nibs when simply crushed and pounded form what is commonly known as cocoa, and when mixed with sugar, vanilla, cinnamon, or other spices, as chocolate. It is much used, more in southern than in northern countries, and particularly in the Spanish peninsula, and in Italy. In the latter country it is combined with coffee to form *mischiata*. Besides being employed as a drink, chocolate is formed into an edible paste flavoured with different materials. Most people are acquainted with it in this form, or in that of creams and ices. Containing much nitrogenous matter it is a supporting food, and a good flesh-producer. It contains naturally about 50 per cent. of fat, which amount may be reduced in the process of manufacture to suit varying tastes and needs. An Italian compound consisting of chocolate, milk, and raw egg, is a rich food, and is called *La Gloria*. The substance, like its name, was introduced from Mexico.

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is a conductor for the purpose of giving uniformity and coherence, though often, indeed generally, in the case of church choirs there is no conductor properly so-called, and the singers are kept together simply by means of the organ or other accompaniment. Again with church choirs it is a moot point whether they are more effective with or without an accompaniment. The latter practice, which requires a greater degree of skill, is in vogue in the Eastern Church. The choir at St. Petersburg consists of 120 men and boys. In the Roman Church it is usual to have an accompaniment, though the famous Sistine Choir at Rome dispenses with this aid. In some cases the choir only lead the congregation instead of being solely responsible for the music. This is the case in some degree in the Lutheran Church, where choir and congregation sing alternately, as for instance in the great church of Berlin, and in the church of St. Thomas at Leipzig, and in England there is in some parts a strong feeling in favour of what is called congregational singing. In English cathedrals much attention is paid to choral music, and the choir is generally endowed. That of Durham cathedral has an endowment of £2,400. Some of the choral part of the service is conducted antiphonally, the sides being called Cantoris and Decani from the respective positions of the dean and the precentor. Where there is a precentor he is responsible generally for the music, its selection, etc., while the organist is responsible for its execution, the training of the choir, and the arrangement of practices. Among the most notable of English choirs are those of New and Magdalen Colleges, Oxford, and that of the Middle Temple in London, while the music at the Italian church in Hatton Garden attracts many listeners.

Choiseul - Amboise. ÉTIENNE FRANÇOIS, DUC DE CHOISEUL ET D'AMBOISE, was born in 1719, and as Comte de Stainville entered the French army, rising ultimately to the rank of general. Having won the good graces of Madame de Pompadour, mistress of Louis XV., he was named ambassador to Rome and Vienna, and in 1758 received the portfolio of foreign affairs with a dukedom. His influence with the king was unbounded. In 1760 he expelled the Jesuits from France. He is credited with having stirred up the British colonies to revolt, and with drawing up the Family Compact between the Bourbons in 1761. Resigning the foreign ministry to his cousin the Duc de Praslin, he took charge both of the military and naval departments, and in 1763 concluded the Treaty of Paris. After La Pompadour's death he ventured to show contempt for Madame du Barry, the new favourite, and therefore was driven from power in 1770. He spent the rest of his life at Chanteloup or in Paris, surrounded by a literary and artistic circle, and often consulted by the king on political affairs. Voltaire was one of his friends. He died in 1785, leaving no children. The memoirs attributed to him are not authentic.

Choiseul - Gouffier, MARIE GABRIEL, COMTE DE, was born in 1752, and visiting Greece in 1776, commenced the publication of his travels,

a work which obtained him a place in the French Academy in 1784. He was sent as Ambassador to Constantinople, and was there at the outbreak of the French revolution, when, to avoid arrest, he took refuge at St. Petersburg, and was received with distinction. In 1802 he returned to France, and resumed his political and literary career. He died at Aix-la-Chapelle in 1817, and his interesting antiquarian collection may be seen in the Louvre.

Choke Damp, the name given to the carbonic acid gas which is found accumulated in coal-pits, wells, etc. After explosion of fire-damp (CH_4) in coal-mines large quantities of this gas are formed, and it is also called "after-damp." It does not support life [CARBONIC ACID], and frequently in colliery explosions more deaths are attributable to it than to the explosion itself.

Choking. The impaction of a foreign body in the air passages gives rise to very alarming symptoms. The offending substance may be within reach and admit of removal by the finger; in the case of a child suddenly developing intense dyspnoea it may be necessary to promptly invert the body, holding the sufferer by the heels and striking him between the shoulders. The dyspnoea, due to the impaction of a foreign body in the orifice of the glottis, at once assumes its maximum intensity; it may prove immediately fatal, or may pass off for a time to be succeeded by recurring attacks of spasm until the obstructing substance is removed. In rare instances a foreign body may find its way into the trachea, or into a bronchus (usually the right bronchus). The surgeon can sometimes detect the intruding object with the laryngoscope, and remove it with laryngeal forceps, or it may be necessary to perform laryngotomy or tracheotomy. If the source of trouble be in the larynx, opening the trachea at once affords relief; it may be possible to remove a foreign body through the tracheotomy wound. Acute dyspnoea sometimes arises from spasm of the laryngeal muscles, caused by irritant vapours, or as in the disease known as *laryngismus stridulus*. This affection occurs in infants who are teething and are the subjects of rickets. In catarrhal inflammation of the larynx, dyspnoea may develop very suddenly; this is particularly the case with children. A "croupy cough" in a child is a symptom that admits of no delay in the procurement of skilled advice.

Choktaws, or CHOCTAWS (CHAKTAS), a North American nation akin to the Chikasaws, who formerly occupied both banks of the Yazoo affluent of the Mississippi. In 1830 they surrendered to the United States Government their hunting-grounds in this region (about 10,000,000 acres) for a sum which appears never to have been paid. At present they are settled on a reserve in Indian Territory at the angle formed by the state of Arkansas with Texas limited N. by the Arkansas, S. by the Red River, about 6,690,000 acres, mostly under maize. The Choktaws, whose ancient culture is somewhat highly coloured by Chateaubriand in *Atala*, are still one of the most polished of all North American nations; they increased

Causation. As regards the causation of cholera, it is clear that the influence in the matter of the disease is more often affected by the altitude. According to the position of the ground water pipes, the determining outbreaks of cholera and poison develops most frequently in porous, and a rise in the water level has rendered the most serious symptoms to be observed. The disease is spread by the cholera bacillus, which supports the view. Some view. Such stools as attract attention to the cyanide were made in the direction of 1884 of the numerous

Treatment. There is no known specific treatment of any avail in the disease. All that can be done is to treat symptoms as they present themselves. In the stage of collapse the injection of saline solutions into the veins has sometimes been attended with success. The treatment *par excellence* of cholera is preventive treatment. The improved sanitary conditions which have been brought about in Great Britain are held by the best authorities to have rendered the fear of a formidable epidemic a thing of the past. Cholera can obtain no hold upon a district which has a pure water supply, good drainage, and satisfactory hygienic surroundings. It is a wise precaution, if cases of the disease occur, to boil all water before use, and scrupulous disinfection of the excreta of patients and destruction of soiled clothing should be enforced. Quarantine is quite useless as a means of prevention if the conditions necessary for the spread of the disease exist; the most rigid quarantine will be powerless to prevent the introduction of the poison, and therefore powerless to prevent its diffusion. All cholera-infected vessels arriving in British ports are dealt with under an order of the Local Government Board which provides for medical inspection, isolation of declared and doubtful cases of the disease, and disinfection. Passengers who present no symptoms of the disease are allowed to proceed to their destination, their names and addresses being transmitted to the medical officer of the district for which they are bound.

Cholesterin, a monatomic alcohol having the formula $C_{27}H_{46}O$. It is a normal constituent of bile, in which fluid it is probably held in solution by the bile salts. Under certain diseased conditions cholesterin becomes deposited in the biliary passages, forming concretions known as gall stones. [CALCULUS.] Cholesterin is insoluble in water, soluble in ether or boiling alcohol; it crystallises in needles or in peculiar rhombic scales. Besides occurring in bile, it has been shown to be present in certain exudations, in disorganised eyes, in yolk of egg, and in certain plants. As obtained in an impure state from wool grease it is known commercially as *lanolin*, and is used in medicine to form ointments, etc., and also for the manufacture of cosmetics and pomades.

Cholet, a town in the department of Maine-et-Loire, France, on the right bank of the Maine, 11 miles S. of Beaupréau, which it has supplanted as capital of the arrondissement. It is the seat of an extensive manufacture of cotton and woollen fabrics, handkerchiefs, flannels, and paper.

Cholula, an old city of Mexico, once the capital of a small independent state, stands on the plateau of Anahuac or Puebla, 60 miles S.E. of Mexico, on the way to Vera Cruz, at an elevation of 7,000 feet above the sea. At the time of the Spanish invasion it was known as Chololan, and was the thriving centre of religion, possessing a noble temple of the god Quetzacoatl, built on a pyramid 160 ft. high; the spot is still venerated, being dedicated to the Virgin as the healer of sickness. In 1519 Cortez massacred and pillaged the city, which has now but a small population mostly of Indians.

Chondrin, a substance containing oxygen, hydrogen, nitrogen, and sulphur, but of unknown composition, which is obtained from cartilage by extraction with boiling water. It is uncertain, however, whether it really exists as such in the cartilaginous tissue. It resembles gelatine in many respects, dissolving if boiled with water, and gelatinising on cooling. Boiled with hydrochloric acid it yields a fermentable sugar.

Chondropterygii. [CARTILAGINOUS FISHES.]

Chondrus. [CARRAGEEN.]

Chontals, the aborigines of the extensive Chontales department, Nicaragua, commonly known by the name of Popoluca, which in Aztec means "foreigner" or "barbarian." They are everywhere retreating before the white and half-caste settlers to the recesses of the forest. But they have left evidence of their former presence in the numerous ruins, and especially burial places, met in all parts of the province. The graves, which appear to have been disposed in circles round about the old villages, are of all sizes; some about 20 ft. long by 12 ft. broad. In one was found a pillar 7 ft. high, with a millstone such as those still in use, a knife 10 in. long, a puma's head of natural size, and other objects all carved in stone, besides a quantity of potsherds. A great number of gold ornaments have also been found, as well as stone idols of great size, but no temples or other stone structures.

Chontoquiros, a Peruvian people in the Uuzco Mountains and Ucayali Valley, so called from *chonta*, a "stick," and *quiro* "teeth," because they stain their teeth black with a stick; but their real name is Siriminche. Their language is quite distinct, having no affinity with any other, and Paz Soldan mentions the curious fact that the names of all members of the human body begin with the letter *w*.

Chopin, FREDERICK FRANÇOIS, was born at Zelazowa-Wola, Poland, in 1810, his family being of French origin. Through the generous help of Prince Antoine Radziwill he received an excellent general education, whilst his musical studies progressed under Elsher, the director of the Warsaw Conservatoire. In 1829 he made his *début* as a pianist at Vienna, and was already a complete and fully developed artist. Indeed, his artistic career shows none of the usual progressive stages; such as he was at the end he began to be from the first. Nurtured in aristocratic and cultivated society his genius never aimed at grandeur or popularity. He appealed to the delicate artistic sense, and somewhat artificial, if subtle, sentiment of a select audience. Thus he never attempted the higher forms of composition, but confined himself exclusively to impromptus, waltzes, mazurkas, fantasias, and songs, all designed for the pianoforte, if we except two concertos and a few concerted pieces of chamber music. His works are gems in their way, but they bear to the nobler and more natural productions of the great masters much the same relation as triolets and rondeaux to poetry. As a performer Chopin was unrivalled for absence of all garish display or noisy enthusiasm. Most of the effect was produced by fingering, and the tone throughout was subdued. In 1831 he went to Paris, which henceforth became his home. He fell under the spell of George Sand, who, when his health began to fail in 1837, took him to Majorca, and nursed him so carefully that his life was prolonged till 1849, in spite of the insidious attacks of consumption. He only visited England the year before his death. He may be said to have caught the wild native melody of the Slavonic races, and tamed it for drawing-room use. His art died with him. He has imitators, but he founded no school.

Chorale, in *Music*, a simple melody written as a psalm or hymn tune to be sung in chorus. The chorale had its origin with the Lutherans, who used it with very great effect. The famous "*Ein feste Burg*" has been used by Wagner, Bach, Mendelssohn, and Meyerbeer.

Chord, in *Geometry*, is the line joining any two points on a curve. The limiting position of this line, as one point is brought nearer and nearer to the other, is the tangent at this point. In the case of a circle any chord is bisected by the perpendicular on to it from the centre, and diminishes in length as its distance from the centre increases. Hence the greatest chords of a circle are its diameters, all passing through the centre, and all of equal length. Given the radius of a circle

and the length of chord subtending any angle at the centre, we may construct this angle. Thus, a *scale of chords* is sometimes used for marking off angles, though the *protractor* (q.v.) is better for the purpose. If two circles intersect, they possess a common chord, the line joining their two points of intersection. All tangents to the two circles from any point on the common chord are of equal length. If three circles intersect, there will be three such common chords or *radical axes* as they are termed. These three axes will invariably be found to pass through one point. In any conic section the mid-points of chords parallel to any diameter lie on a line through the centre of the conic parallel to the tangents at the extremities of the given diameter.

In the theory of sound a *chord* is understood to mean the simultaneous production of simple sounds in harmony with each other. The vibration-numbers for the constituent sounds must be in simple ratios, or else discordant effects are produced. Thus the notes C, E, and G, forming the *common chord*, have their vibration numbers in the ratio 4 : 5 : 6. In the minor key the ratios are slightly more complex, the faint suggestion of discord producing a favourable effect. There are very many different names given to particular chords, such as *common chord*, *diminished*, *augmented*, *chord of the dominant*, *of the sixth*, etc., etc.

Chorda dorsalis. [NOTOCHORD.]

Chordata, a phylum or branch of the animal kingdom, characterised by the possession of a rod (the notochord) underlying the central nervous system, and by visceral cæca or gill-slits at the sides of the head or pharynx. The phylum is divided into three groups:—1. Cephalochordata, in which the notochord is retained throughout life; 2. Appendicularia (q.v.); 3. Vertebrata, in which the caudal notochord is retained for a short time or is not developed. [ARTHRALGIA.]

Chorea (Gk. *choros*, dance), a disease of the muscles, characterised by involuntary, purposeless, and irregular movements, and is a remarkable feature of the most part in childhood. It is a disorder of the muscular system.

Causation. It is most common in children between the ages of 5 and 10 years, and is also common in females. It is often associated with rheumatism, and is frequently of the type of chorea minor, in which the movements are not violent. It is often associated with Syphilis, and is then called chorea Syphilitica. It is also associated with the use of certain drugs, such as strychnine, and is then called chorea strychnina.

body. The shoulder is hitched up; the fore-arm and hand seem irresistibly impelled to execute curious purposeless movements; the lower extremities are also involved; the facial muscles by their contraction lead to the production of unexpected and inappropriate grimaces; the head is thrown from side to side; the tongue suddenly jerked out, perhaps bitten by the teeth. All these tumultuous movements are exaggerated by the attempt to use the muscles in a legitimate way, and thus, when the patient tries to hold objects in the hand, to walk, or to speak, the disordered movements interfere in a pronounced manner with the appropriate actions, and hinder or even render impossible the movements which he intends to carry out. These convulsive disorders, though by far the most striking, are by no means the only symptoms of the disease. There is nearly always some degree of paralysis of the affected muscles; loss of sensation, too, may occur; and there is often actual loss of intelligence. Palpitation is not uncommon, and auscultation of the heart not infrequently reveals the presence of valvular disease. In severe attacks of chorea the distress of the patient is very great, he is continually "on the move," he can only be fed with difficulty, sleep is seriously interfered with, bruises and injuries of various kinds may be sustained, and bed sores are apt to prove a formidable complication. In the majority of instances the disease assumes a mild form, and, unless aggravated by inappropriate treatment, tends to subside in four or six weeks; unfortunately, however, it is apt to recur.

Treatment. Attention to ordinary hygienic precautions and the administration of tonics seem to produce as satisfactory results in mild cases as any of the supposed specifics. According to many authorities, however, the administration of small doses of the liquor arsenicalis hastens the restoration to health. In chorea with rheumatic complications anti-rheumatic medicines are indicated. In the worst forms of the disease chloral and opium are of service. The patient's strength must be sustained, and stimulants may have to be given; the wet pack has been employed to restrain extreme violence of movement. Good nursing is of the utmost importance.

Chorion (Gk. *chorion*, skin), one of the foetal membranes which plays an important part in development. The true chorion is described as including the vitelline membrane, the outer layer of the amnion, and the allantois. Its external surface is covered with processes, the chorionic villi, in which are formed loops of capillary blood-vessels. These capillaries undergo special development at the placental site, and, together with outgrowths from the maternal tissue, they gradually build up the highly vascular organ which forms the connecting link between the circulatory systems of mother and foetus. [PLACENTA.]

Chorley, a market town of North Lancashire, about 8 miles S.E. of Preston, on the river Yarrow, with a station on the Lancashire and Yorkshire and North-Western Railways. The parish church of St. Lawrence is Norman, and contains a few

monuments. There is a free grammar school, a town hall, and other public buildings. Situated in the midst of a coal-field Chorley has many factories for the production of calicoes, muslins, chemicals, and machinery. Railway waggons are built on a large scale, and the district yields iron, flag-stones, and mill-stones. Pop. (1901), 26,850.

Chorley, HENRY FOTHERGILL, was born at Blackley Hurst, Lancashire, in 1808. After a desultory education he gave up the idea of making music his profession, and coming to London took to journalism, and found employment on the *Athenæum*. Here his musical knowledge served him in good stead, and he acquired a high reputation as a critic, much of his ephemeral work being summed up in two entertaining books, *Modern German Music*, and *Thirty Years' Musical Recollections*. He was an appreciative supporter of Hullah, Gounod, and Sullivan, but failed to see any merit in Schumann, Berlioz, or Wagner. A personal friend of Mendelssohn, he wrote a preface to his *Letters*. Numberless *libretti* came from his pen, among them Wallace's *Amber Witch*, Benedict's *St. Cecilia*, Sullivan's *Kenilworth*, and Bennett's *May Queen*. He was the author, too, of many songs, and of a few forgotten novels and plays. He died in 1872.

Choroid, the coat of the eyeball lying between the sclerotic externally and the retina within, and terminating in front in the ciliary processes. [EYE.] The choroid coat is highly vascular and deeply pigmented. It is sometimes affected by inflammation (choroiditis). The existence of such a condition is readily detected by ophthalmoscopic examination.

Chorotegans, a Central American people of Nicaragua, south-east of Fonseca Bay, forming a separate group with the Dirians and Nagrandans of Leon, the Orotiñans of Guanacaste, and the Cholutecas of Honduras. They have been affiliated both to the Chiapanecs of East Mexico and to the Mayas of Yucatan, expelled from Cholula in pre-Aztec times. The Chorotegans had attained a considerable degree of culture under Aztec influences, nearly all traces of which were destroyed by the Spanish conquerors. In 1524 the missionaries of Managua made a huge bonfire of all their religious and historical paintings, calendars, maps, and other documents, while their temples were razed to the ground, their idols overthrown, and their graves desecrated. But numerous remains still exist in the islands of Lake Nicaragua, where Squier saw over fifty colossal basalt monoliths of human figures somewhat like those of Easter Island, Polynesia.

Chorus (from the Greek *choros*) signified originally a band of singers and dancers, who took a conspicuous part in solemn functions, especially in the worship of Apollo and Bacchus, where recitations alternated by chanted choruses were employed. From these religious services tragedy and comedy took their rise, the chorus in them being formed of boys or men. Sometimes the chorus represented women, but their parts were always played by men. For example, in the *Hecuba*

of Euripides the chorus is composed of captive Trojan women, while in the tragedy of *Edipus Rex* of Sophocles it consists of the elders of the city. The chorus of Greek tragedy varied in numbers from the 50 or so of Æschylus to the 15 of Sophocles. The leader of the chorus was called *Coryphæus*, a name surviving in our modern ballet, and the general management was in the hands of the *Choragus*, whose post conferred much honour upon its holder, and also entailed upon him great expenses in producing the entertainment and in supporting and providing for the performers. The arrangement of the chorus was occasionally antiphonal. In the revival of the performance of Greek tragedy, of late introduced at our Universities, the Greek practices have been followed so far as possible. The chorus was generally accompanied by flutes, and the music was of a rude and simple nature. In the modern chorus, a large body of voice is generally employed to alternate with solo, duet, etc. Plain song in unison, as practised in many churches, may be looked on as a form of chorus-singing. Bach's *Passion Music*, Handel's *Israel in Egypt*, Mendelssohn's *Elijah* give well-known examples of modern chorus. On the first revival of opera the chorus was intended to resemble in character the Greek chorus, and took little if any part in the action, but this feature gradually changed, and the chorus singing was entrusted to those taking part in the piece, as, for instance, the fishermen in *Masaniello*. Choral singing is much practised in parts of Great Britain, the Welsh and Yorkshire choirs being renowned, while very many have heard the gigantic chorus of the Crystal Palace Handel Festival.

Chose in Action is a right to recover which exists in law as against the actual enjoyment or possession of the thing. Thus money due on a bond is a chose in action, for there is a right to claim the money when payable, but there is no possession of it until it is recovered by course of law, or until payment be first voluntarily made. And so if a man promise or covenant with me to do any act and fail in it whereby I suffer damage, the recompense for this damage is a *chose in action*, for though a right to some recompense vests in me at the time of the damage done, yet what and how large such recompense shall be can only be ascertained by law, and possession can only be given me by legal judgment and execution. A chose in action, then, is a thing rather in *potentiâ* than in *esse*, and the owner may have as absolutely a property in, and be as well entitled to, things *in action* as to things in possession. By the Judicature Act, 1873, any absolute assignment in writing by the assignor of any debt or chose in action on notice given to the debtor or obliger passes the legal right to the same subject to all existing equities therein, as well as all remedies for recovery thereof, to the assignee. Formerly the assignee could not sue in his own name.

Chosroes I., or KHOSRU the Great, succeeded Cabades as King of Persia in 531 A.D. At first he maintained peaceful relations with the Roman

Empire, but subsequently attacked Syria, Mesopotamia, and Cappadocia, and was for a time kept at bay by the famous Belisarius, but after ten years' war he compelled Justinian to cede to him in 562 considerable tracts of territory, to which he added the results of further conquests in the East. Justin II. having refused to continue the subsidy paid by his predecessor, he again made an irruption into Roman dominions, and had just driven Tiberius III. to come to terms, when he died in 579. He was beloved by his Mussulman subjects as a just and generous ruler, but he proved an implacable foe to the Christians. He encouraged literature, and caused the well-known work *Kalilah and Dimnah* to be translated into Persian.

Chosroes II. succeeded to the Persian throne in 591 A.D. on the deposition of his father Hormidas, of whose murder he was suspected. Expelled by his subjects on account of his cruelty he sought the aid of Mauricius, the Roman Emperor at Byzantium, and by his aid was restored. When Phocas de-throned and killed Mauricius, Chosroes, under the pretext of avenging his death, marched, in 604, with a large force into Asia Minor, and extended his conquests as far as Carthage. In 622 he was defeated and forced back into his own dominions by Heraclius. Five years later he was deposed and put to death by his son Sirves.

Chota Nagpore [CHUTIA NAGPUR, LITTLE NAGPORE], a division or commissionership in the S.W. of Bengal, comprising the four districts of Hazaribagh, Lohardaga, Singhbhum, and Maubhum, the seven tributary states of Chango, Larkhar, Korea, Sirguja, Udaipur, Jax, and Bonal, and the two semi-independent states of Sarai and Saraikala. The total population is about 1,000,000, and the population of the Feudatory States is about 500,000. The primitive Kolars and Gond settlers. The territory is mostly a great plain, and drained by the Godavari, and the Godavari. The outlying districts are mostly hilly, with forests yielding teak, and with wild animals. The principal crops are wheat, barley, pulses, and iron exist, but have not been worked to defective communication.

Chosroes now ruled by the owl, and to have been the first of the named as began again. fare Cadour men. Hocher, 1799. a rising Loire and

Berri, the movement in this latter case being suppressed by M. Thiers.

Chough (*Pyrrhocorax graculus*), a somewhat rare British bird of the Crow family, now confined to the high cliffs of the south-western counties, though it formerly ranged inland, and eastward to Kent, (*Lear* iv. 6). The male is about seventeen inches long, and has jet-black plumage, glossed with steel-blue; the beak, legs, and toes are coral-red. The female is smaller, and the hue of her plumage is not so decided. These birds feed on insects, crustaceans, and berries, sometimes on grain, and, it is said, on carrion. The nest, containing four or five eggs, yellowish, marked with light-brown, is generally made in a hole in lofty rocks or in some ruin. The epithet "russet-pated" (*Midsummer Night's Dream*, iii. 2) is probably a misreading for "russet-pated" (= red-footed), which is adopted in the Clarendon Press edition of the play. *P. alpinus* is the Alpine Chough.

Chretien, or CHRESTIENS DE TROYES, a poet and romance-writer of the 12th century, of whose life little is known, but as several of his works were dedicated to Philip of Alsace, Count of Flanders, killed at the siege of St. Jean d'Acre (1190), it is conjectured that he lived under the patronage of that prince. His death is assigned to 1196. As specimens of early French language and style, and as supplying links in the Arthurian legend, his remains are of high interest. They display, moreover, considerable ingenuity, and a pure yet vivid imagination. The six romances that may be confidently pronounced to be his are:—1. *Irec et Enide*, from which Tennyson has borrowed; 2. *Cligés or Cliget*; 3. *Le Chevalier au Lion*; 4. *Guillaume d'Angleterre*, more modern in treatment; 5. *Le Chevalier de la Charette*, dealing with Lancelot du Lac; and 6. *Percival le Gallois*, a very popular poem translated into all the languages of Europe. *Tristan et Yseult*, and *Le Chevalier de l'Épée* are lost, and the other poems attributed to him are unauthentic.

Chrisom, a flask used to contain the sacred oil or *chrism* with which a child was anointed at baptism, and also denoting the white linen cloth which was bound upon the child's head by the priest to keep the sacred oil for a time upon the brow. A *chrism child* denoted one who died within a month of birth. Jeremy Taylor speaks of "phantasms that make a chrism child to smile," and Dame Quickly tells us how "a parted like any chrism child," when recounting Falstaff's death.

Christ. [JESUS CHRIST, MESSIAH.]

Christadelphians (brothers of Christ, or in Christ), an American sect which arose during the Civil war in America, and is said to have had its origin in the desire of some to avoid military service. The founder was Dr. John Thomas, of Brooklyn, from whom the sect is also called "Thomasites." It claims to reproduce the feelings of Apostolic times, and among its peculiar tenets are the absence of a personal devil, plenary inspiration of the Scriptures, the belief in the coming

physical reign of Christ upon the earth, and a conditional immortality, *i.e.* that for most death is a final unconsciousness, while others will rise again to be rewarded or to relapse into annihilation. The sect exists also in Great Britain, having its organ, *The Christadelphian*, at Birmingham. The doctrine is to be found in the *Elpis Israel*, and *Eureka* of Dr. Thomas, and in *Christendom Astray* of R. Roberts.

Christchurch. 1. A ancient municipal and parliamentary borough of Hampshire, situated at the confluence of the Avon and the Stour, $1\frac{1}{2}$ mile from the sea, and 22 miles S.W. of Southampton. Until recently it was known as Christchurch Twineham, the latter word being a corruption of the Saxon Tweonaetean. The Church of Augustinian priors, founded in the 12th century, is a noble specimen of Norman and Perpendicular architecture, and contains a fine rood screen of the 14th century, and a chapel built by Margaret, Countess of Salisbury, some 200 years later. A monument to Shelley stands in the west tower. There are also remains of a Norman castle attributed to the reign of Henry II. Clocks, watches, and hosiery are the chief manufactures, and salmon-fishing is carried on in the Avon. In Christchurch Bay there is a double tide every twelve hours. Pop. (1901), 4,204. 2. The capital of the province of Canterbury, New Zealand, stands on both sides of the river Avon, 5 miles from the sea. It is surrounded by the level expanse of the Canterbury Plains, but the neighbouring district has been thickly planted with trees. The town is well laid out with broad, straight streets, and a good water supply is derived from artesian wells. It is connected with the port of Lyttelton by a railway 8 miles in length, and is the centre of the growing railway system of the province.

Christian, the surname of a distinguished British naval family, of whom the most noteworthy representative was Hugh Cloberry, who, born in 1747, commanded the *Suffolk*, 74, in Byron's action with d'Estaing in 1779, who was in the action with M. de Guichen in April and May, 1780, and who commanded the naval force at the reduction of St. Lucia in 1796. He died a rear-admiral and a K.B. in November 1798, at which time he was commander-in-chief at the Cape of Good Hope. His eldest son, Hugh Hanway, born in 1784, also rendered good service during the French wars, and died a rear-admiral in 1849.

Christian, or **CHRISTIERN**, the name of nine kings of Denmark, including the reigning sovereign. The more important of these are—

Christian II., who was born in 1481, came to the throne in 1513, and married Isabella, sister of the Emperor Charles V. He conquered Sweden in 1520, and by his cruelty to the leading inhabitants earned the sobriquet of "The Nero of the North." In 1522 Gustavus Vasa liberated his country, and thereupon the Danes deposed their monarch, who, after a vain attempt to recover his kingdom in 1531, was seized, and kept in prison until his death in 1559.

Christian IV., born in 1577, succeeded his father, Frederick II., in 1588, and married Anne

Catherine of Brandenburg. He engaged in a war with Sweden, which terminated in a peace in 1613. His military abilities led to his being put in command of the army of the Protestant League in the war against Austria (1625). Tilly defeated him at Lutter, and compelled him to accept humiliating terms. From 1641 to 1645 he was involved in another ineffectual struggle with Sweden. His admirable qualities made him very popular with his subjects, and several towns were named after him. He died in 1648.

Christian Connection, an American sect founded early in the 19th century, and existing in North Carolina, Vermont, Kentucky, and Tennessee. Although there is no creed, the sect is chiefly Baptist and Unitarian in views.

Christian Knowledge, SOCIETY FOR PROMOTING (commonly known by the initials S.P.C.K.), is a society founded in 1698, and dating its present name from 1701, for the purposes, 1st, of promoting and encouraging the building of churches and schools in England and Wales, and 2nd, for dispersing Bibles and tracts at home and abroad, and advancing the diffusion of Christian knowledge. It has now a wider scope. With a revenue of £40,000 a year it sends out missionaries, translates the Bible into different languages, edits grammars and dictionaries for the use of missionaries and others, and publishes works of many kinds.

Christian Scientists, a small body of people (mainly Americans) whose principles brought them into notoriety at the end of the 19th century and the beginning of the 20th. They denied the existence of pain and disease, and refused to have medical treatments, a course which in one or two celebrated cases led to somewhat awkward results.

Christian Sound, a bay to the S. of Tierra del Fuego, 120 miles N.W. of Cape Horn. It was discovered in 1774.

Christiania, the capital of Norway, is a port situated at the extremity of the Christiania Fjord, at some 80 miles from the sea, in the province of Aggershuus. Behind it rises the wooded mountain of Egeberg. The modern town was founded by Christian IV. in 1624, on the site of the ancient capital, Oslo, now a mere suburb. The fortress of Akershus, the ramparts of which form a promenade, defends the harbour, where a brisk export trade is carried on in timber, pitch, hides, skins, oil-cake, salt fish, and iron, the imports being wheat, hardware, wines, and fancy goods. The chief public buildings are the royal palace, the legislative chambers or house of the Storting, the university (1813), the cathedral (a cruciform edifice of brick), the museums, and the observatory. The streets are well built, and lighted with gas. There is railway communication with the chief inland towns, and with Sweden, and lines of steamers run to Lubeck, Hamburg, Amsterdam, London, Hull, etc. Among the principal manufactures are cotton fabrics, paper, soap, spirits, beer, and dressed timber.

Christianity is the name applied to that religion which professes allegiance to Christ as its

head. The origin of the name involves a question not altogether free from doubt. The word "Christianity" is not found in the Bible, and "Christian" only occurs three times (Acts xi. 26; xxvi. 28; 1 Peter iv. 16). It does not appear in the first of these passages whether the name was given in scorn by adversaries of the Church, or adopted by the believers themselves, but probability is in favour of the first view. The Antiochenes were noted for their habit of bestowing nicknames, and this was probably an instance of it. In the second passage there was contempt implied in Agrippa's words, and in the third St. Peter again implies that the world continued this contempt. Obviously the word meant persons who looked upon Jesus of Nazareth as the Christ, the Anointed One of God, whom prophets had foretold.

As the faith grew and was admitted as an existing fact, the name became its recognised name among believers. And the main features of the history of that first ingathering is recorded for us in the Acts of the Apostles. These features are, first, the conversions made among the Jews (Acts ii. vii), and in the neighbouring countries, and afterwards the great missionary work done among the heathens, mainly by St. Paul. And this brings us to the first great controversy which arose within the borders of Christianity, that between "the Circumcision and the Uncircumcision;" in other words, between those Jews who accepted Jesus as the Christ and the heathens who did the like. The Judaisers, as they were called, were those Jewish converts who were willing to recognise the heathen believers, but insisted that they must submit to Jewish observances. This was the great controversy of the first century. The Epistle to the Galatians is a masterpiece of vindication of Gentile freedom from Jewish bondage, as he called them, and in it St. Paul has much of it, too, in many references to the subject.

Before the New Testament was written, the subject of controversy of Christianity to the world. The origin of evil were subjects of attention of many a thing have gone on doing questions which in answers which were heresies of the Incarnation evil," and have been an appendix. Those who (Gk. *doke* speculator flesh and the Divine and material its place multitudes endless years of

vindication of the doctrine of the Incarnation of God, and his Epistles are indignant warnings that the denial of that doctrine is Antichrist.

All this time Christianity had been moulding itself into visible shape. The Sacraments of Baptism and the Lord's Supper, ordained by Christ Himself, were the distinguishing symbols of the Church from the very beginning, and the Acts give the plainest indications that there was a recognised ministry, though details concerning it are few. We have more in the pastoral Epistles of St. Paul to Timothy and Titus.

After the close of the New Testament the literature of Christianity became for a time scanty; the continuous stream being taken up about the beginning of the second century. The first Christian fathers, so far as they have come down to us, all wrote in Greek. The earliest Latin father was Tertullian. Between the close of the New Testament and his days came first what are known as the "Apostolic Fathers," Barnabas, Ignatius, Polycarp, Hermas, Clement of Rome. The writings of these fathers are of varying degrees of value, that value turning mainly upon two subjects—(1) the evidence furnished that the New Testament as now received was so received then, and (2) the light thrown upon ecclesiastical order and discipline. Thus, great stress is laid by Episcopalians on the fact that the three orders of ministry are recognised by Ignatius, but the opponents of this form of Christianity dispute the genuineness of his writings.

The persecutions to which the Church was subjected in the New Testament were mostly Jewish, the exception being where personal gain was involved, as at Ephesus and Philippi. But as the Church spread, heathenism became alarmed. For Christianity was not satisfied to hold its own opinions and let others hold theirs, it put forth a claim to universal obedience. Consequently the laws against "secret assemblies" and "non-licensed religions" were revived, and for the first three centuries persecution was carried on against Christianity, now fierce and active, now slumbering. The chief persecuting emperors were Nero, Marcus Aurelius, Decius, Diocletian. But nothing could hinder the progress of the Church, and the conversion of Constantine in the beginning of the fourth century was followed by the establishment of Christianity as the national faith of the Roman Empire.

There had been controversies and heresies all through the period of persecution, but they had been confined to particular localities. The establishment of the faith through the empire was almost immediately followed by the most serious doctrinal conflict which the Church ever went through. Arius, a priest of Alexandria, objected to some statements of his bishop, and committed himself to a doctrine, which denied the Godhead of Christ. Hot controversy followed, and made its way all over the empire. Constantine, following imperial instincts, summoned a great council at Nicæa in 325, at which Arius was condemned, mainly through the eloquence and clearness of statement of Athanasius, a young deacon of Alexandria. But though Arius

was condemned, his doctrine found enthusiastic supporters, and this among the imperial family; and the consequence was serious and lasting. Not only was the Church almost torn asunder with the controversy, but the Teutonic nations, who were now gathering on the northern frontiers of the empire, soon to break in upon it, conquer it, and break it up into fresh kingdoms, were converted from heathenism to Arianism, mainly by the energy of Ulfilas, a learned and self-devoted bishop of that faith. The Arianising of the Goths at once set them in fierce antagonism with the clergy, who remained true to the decisions of the Nicene Council, and who showed by their action that they preferred heathenism to Arian heresy. We have here the main cause of the falling to pieces of the first Gothic kingdoms which were set up in Italy, Gaul, and Spain. Thus it was the orthodox clergy who invited Clovis, the heathen Frank, to invade and overthrow the Visigothic kingdom of Gaul; he came, and soon after was baptised into the Catholic faith by St. Remy. Somewhat later a similar invitation was given as regarded Spain.

But we must go back a little. The Arian controversy was followed or accompanied by others springing out of it. Thus a second great council was held at Constantinople in 381, which asserted Christ's perfect manhood, both in body and soul, which Apollinaris, in his zeal against Arius, had denied. The third council, that of Ephesus, A.D. 431, declared that Christ, perfect God and perfect man, was yet One Person; and that of Chalcedon in 451, that in the One Person the two natures are distinct. These are the first four general councils.

The eastern provinces of the Roman Empire, though they had been entirely subdued to it, had never become fused in it as Gaul and Spain had been. In the latter countries the Latin language had largely entered into the common speech of the people, and Roman law prevailed. But in Greece the native language held its ground, and in the oriental countries the civilisation as well as language never became displaced. All this had its effect on Christianity. The Greeks held to their metaphysical subtleties whilst the Latins showed their attachment to sharp and clear definition. The Apostles' and Nicene Creeds were the product of Eastern Christianity, the Athanasian of Western. The difference of view was to end in a serious conflict. The Nicene Creed, which had received some additions at the Council of Constantinople, declared that the "Holy Ghost proceedeth from the Father." In the 7th century the Western Church added the words "and the Son" (*filiogue*), and the addition was strenuously resisted by the Greeks. Here was the beginning of a divergence, which, followed by the denial on the part of the Greeks of certain claims of the Bishop of Rome, produced in the eleventh century the division between the East and West which remains to this day.

But before this disruption another terrible calamity had fallen on Christendom. Dissensions about the use of images and other subjects had much injured Christian feeling and unity in the

East, when Mohammed suddenly appeared in the 7th century and declared that he was a prophet divinely commissioned to declare the Unity of God, and to enforce it by his authority upon the nations. At the head of fierce armies of followers he rushed over Arabia and the adjacent countries, and succeeded in establishing his faith within them. From that time until now Mohammedanism has been the religion of all the Asiatic countries which had been under the Roman rule, and it has also run along North Africa, and even established itself in Eastern Europe, in the ancient city of Constantine. No such bitter foe has Christianity had.

Other causes had co-operated to the injury which the Church was destined to suffer. The downfall of the Roman Empire was a necessity arising out of its luxury and corruption, and the establishment of the rule of a fresh race was bringing new life to that which was ready to die. But such revolutions mean terrible misery and bloodshed to those in whose time they are brought about, and so for many years Europe was desolated by horrible wars. Missionary effort was checked, though there are always sparks of light visible among the darkness. The names of Augustine, and Columba, and Boniface, all belong to these days.

The great changes which passed over the nations gave an impetus to one institution, not discernible at all in the first days, but which was now overshadowing Christendom. Whilst Rome was changing its rulers again and again, its bishop was held in respect by all in succession, as representing the faith which all held in common. The hierarchy of the Church held their own, when nothing did besides. So long as the emperors held undisputed rule, the bishops of Rome remained obscure; but when the imperial power came to nought, the people looked to the bishop as their Pope, or father; and Pope Leo the Great was the most important person in Italy. This was the origin of the Papal power. And as religion suffered under war and tumult, so also did learning. Literature, both religious and secular, all but died, and so we come to what are commonly known as the dark ages. They may be fixed as lasting from the 7th to the end of the 10th century. By that time the nations of the new Europe had roughly hewn out their fresh kingdoms, they were becoming consolidated, and there was a yearning after dynastic settlement. High above all, so far as Christianity was concerned, stood the Pope of Rome. Charles the Great of Germany had restored what was called "the Roman Empire," differentiating it from the old by calling it "the Holy," and visibly showing this by being crowned by the Pope at Rome. But his empire, though it preserved its title till the year 1806, was, in a very few years after his death, dismembered. Italy was lopped off it, and France became independent. Then the Roman Pope stood confessed as the representative of unchanging power. The great name connected with the claim of the Pope to be the representative of God on earth is that of Gregory VII. (Hildebrand), who was Pontiff from 1073 to 1085. From that time for many years the Popes were the arbiters of kingdoms. Innocent III. (1198-1216) put forth

more extravagant claims than Hildebrand. And the time of this ecclesiastical supremacy was marked by a revival, not indeed of literature in its modern secular sense, but of ecclesiastical learning and of speculation in theology and metaphysics. It was the age of the schoolmen and of monasticism. The latter institution, begun in the 4th century, was now spread over Europe, and the monasteries, though we admit the abuses and evils which were undoubtedly connected with them, had been mighty civilisers. To take only Great Britain, the beautiful ruins of Beaulieu, of Waverley, of Fountains and Tintern remain as memorials of the great Cistercian movement which led men to go into spots where was barrenness and swamp, and to cultivate and drain these, to breed cattle and sheep, to plant gardens and sow corn, and withal to work in the cloister with such assiduity, that, humanly speaking, we must admit that the knowledge and the copies of the Scriptures would have perished but for them.

With Innocent III. the Papal power culminated. Even higher pretensions than his were put forward by some of his successors, but they were not recognised. From his time the tide receded. The causes for this were manifold and complicated. The consolidation of the European kingdoms, the abandonment of the Crusades, the weakening of feudalism—all these things meant for a while the increase of monarchical power, and this in its turn meant enmity to the power of the Popes. The work so largely carried on by the monks, though at first it appeared to favour the ecclesiastical system, in the end undermined it by encouraging a system of inquiry into historical and scientific facts. In Great Britain, Roger Bacon, as a pioneer of the scientific movement, pointed out the causes of the corruption of so many of the sciences. The illustration of the first principles in the history of France, and the humbled Pope John XXII. to force the Popes to their residence at Avignon, became altogether impossible. When at length they were expelled, which immediately led to the great Papal schism, in which for years rivaling each other. The public mind was thus freed from the influence of the clergy, and under the preaching of Bohemius, the Pope's authority was declared to be Reformation, the human ability of the

the most important epochs in the history of Christianity, its separation into many separate communions, all nevertheless united in professing allegiance to Christ as their head. The points of divergence between them it would be an endless task to enumerate; but we may venture to assert that all who profess and call themselves Christians regard Christ as their leader and example. The Unitarians, though denying the Deity of Christ, are very emphatic in insisting on the Divine nature of His life, and in proclaiming Him as the supreme example. With the exception of this body, no professing Christians, probably, would hesitate to express their adherence to the Apostles' and Nicene Creeds, and these, therefore, may be taken as the general *symbola* of our common Christianity. The opponents of Christianity may be broadly divided into two classes, Agnostics (q.v.) and Materialists (q.v.). Of these the most numerous and probably the most formidable are the Agnostics.

The great division in the 16th century, resulting in the establishment of the Protestant communions, was followed by a reaction, mainly seen on the Continent, but not without important influence on England. This reaction was largely due to Ignatius Loyola, the founder of the Jesuits. That body, with other kindred bodies, made a new departure in the way of missionary enterprise, a work which had almost died out in the Middle Ages, but which not only the outburst of religious zeal, but the marvellous geographical discoveries of the 15th and 16th centuries, stimulated to a great degree. It was not until the 18th century that Protestant zeal made its grand and wonderfully successful effort, headed among Englishmen by Carey and Marshman, and taken up with a zeal begotten by admiration of their labours and thankfulness at their success. [MISSION.] That zeal still glows, and the missionary work of the 19th and 20th centuries is a prominent feature of the religious aspect of the time, and in spite of drawbacks the results are promising that the time is hastening on when the world itself will be converted to Christianity.

Christiansand, a fortified port of Norway on a fjord opening into the Skaggerack. It is surrounded on three sides by water, and possesses a fine harbour, protected by the fort of Frederichsholm. The Gothic cathedral is a handsome building; the streets are wide and regular, and the houses are mostly of wood. It is the seat of a provincial governor and a bishop, and serves as a naval station. Tanning, brewing, dyeing, and ship-building are the chief industries; and the exports include sea-fish, salmon and lobsters (fresh and tinned), timber, pitch, skins, copper, and iron. The British occupied the place in 1807.

Christianstad, a province (*laen*) and its capital in the S. of Sweden. The former has an area of 2,400 square miles, principally in the valley of the Helge. The soil, though swampy in parts, is fertile, and produces hemp, flax, timber, corn, and hops. The town stands on a sort of lagoon formed by the Helge about eight miles from the Baltic, the port Åhus being at the mouth of the river. It was founded by Christian IV. of Denmark in 1614,

This is one of

and was the starting-point of the revolution that put Gustavus III. in power. It contains a fine church, the governor's house, a high school, an arsenal, etc., and produces woollen and leather goods, gloves, and tobacco.

Christiansund, a port in the court or circle of Romsdal, Norway, 85 miles S.W. of Trondhjem. It is built on three islets, between which the harbour is enclosed, and until 1742 was known as Lille-Fosen. The wooden houses, painted red, are dotted about the rugged rocks in quaint disorder. The place does a brisk trade in salt fish with Spain and Italy.

Christina, Queen of Sweden, the daughter of Gustavus Adolphus and Mary Eleanor of Brandenburg, was born in 1626, and came to the throne six years later, her father having fallen at Lützen. Her father had already begun to fit her for her position by giving her a masculine education, and this plan was adhered to by her aunt Catherine and the chancellor, Axel Oxenstiern. Though slightly deformed in one shoulder, exceedingly spare and wiry, and below middle stature, her face was, perhaps, attractive; she excelled in manly exercises, often wearing male attire; and she mastered an immense amount of general knowledge, besides Greek, Latin, and several modern languages. There can be little doubt, however, that her mind was warped by insanity. Still, on first assuming power in 1644 she displayed firmness, moderation, and wisdom. She brought the war with Denmark to an advantageous conclusion; she terminated the Thirty Years' war by the peace of Westphalia; she devoted much attention to commerce and education; and she filled her court with learned men, such as Descartes, Grotius, Salmasius, and Vossius. Gradually, under the influence of foreign advisers, especially her French physician, Bourdelot, her conduct changed. She became recklessly extravagant, and refusing all offers of marriage, she indulged her passions and her vanity in the society of favourites, on whom were showered honours and rewards. She estranged herself from Lutheranism, and grew to dislike the homely simplicity of the North. In 1649 she formally named her cousin, Charles Gustavus, as her successor, and in 1654, when the discontent of her subjects showed itself in the revolt of Messenius, she definitely resigned the crown. In a man's dress, with a handsome income and considerable retinue, she now set out on her travels, and after passing through Denmark and Germany, and spending a year at Brussels, she went to Rome, and was received into the Church by the Pope. In 1656 she visited France and was well received, but returning next year met with a much colder welcome. On her condemning to death her favourite, Monaldeschi, and causing him to be privately executed in her own apartments, she was expelled from French territory. On the death of her cousin in 1660 she claimed the Swedish crown, but her subjects refused to listen to her. In 1666 she made another fruitless attempt to regain her position. The last twenty years of her life were spent in Rome, where she divided her energies between petty intrigues and the collection of works

of art. At her death in 1689 many of her treasures were bought by Pope Alexander VII., Odescalchi, and the Duke of Orleans.

Christina Maria, Regent of Spain, was born in 1806, being the daughter of Francis I. of Naples. She married Ferdinand VII. of Spain in 1829, and on his death, four years later, became regent for her infant daughter Isabella. She soon found herself opposed by the Carlists, and Espartero, having defeated them, headed a movement against the sovereign, who had made herself disliked by her marriage with Fernando Munoz, an officer of the guards, and by her tyrannical conduct. After the rising of Narvaez in 1843 she returned to Madrid, and remained there till 1854, when O'Donnell and Espartero combined to put an end to her influence. She retired to France, and died at her villa near Havre in 1878.

Christison, SIR ROBERT, BART., M.D., F.R.S., born in 1798, graduated at the University of Edinburgh in 1819, and from the outset of his career devoted himself especially to chemistry, materia medica, and the forensic aspects of his profession. After a course of study under Orfila in Paris, he returned to occupy the chair of medical jurisprudence at Edinburgh, exchanging it in 1832 for that of materia medica, which he held until 1877. His *Treatise on Poisons* was for a long time the received text-book in medical schools and courts of law. He gave important evidence on the trial of Palmer in 1856. He was twice President of the College of Physicians, Edinburgh, and was Physician in Ordinary to the Queen in Scotland. In 1871 her Majesty conferred on him a baronetcy, and he died in 1882.

Christmas, the festival commemorating the birth of Christ, seems to have first been of positive observance between 180-190 A.D. Diocletian is reported to have burnt in their church a number of Christians who had assembled to observe Christmas. It has in different times and places been observed at different times of the year; but the actual birth could not have taken place in December, since the rainy season then prevails in Palestine. The feast seems always to have been in greater favour with northern than with southern nations, a fact which may be owing to the wisdom of the Church in fitting its own proper doctrines in with the prevailing worship of the old gods and the powers of nature. The old Yule has come down almost unchanged. The manger songs, dramas and carols which marked the period gradually died away, but the latter have been much revived of late, and in one spot at least the Boar's Head carol with its accompaniments has been handed down in an unbroken line. The old customs of giving presents and of feasting are still in some repute, though the time of the festival is much shortened—it having formerly lasted until Epiphany at least, and sometimes till Candlemas. The Christmas tree is said to have been adopted from the Saturnalia of Pagan Rome, and may have been introduced into Germany by Roman troops. Virgil is said to have alluded to it. The French Noel (*natalis*) is but the

Charles was a negro slave. First he was he applied to a hotel at P'oumout of good character received in 1766. He told Toussaint seized

Christ's Hospital, a large London school, for many years situated in Newgate Street, on the site of a monastery of grey friars, and well-known to Londoners and the country at large, both by the quaint Tudor dress of its boys and from the advantages it bestows on many English boys. It was finally removed to a site near Horsham in 1902. The yellow stockings, belt, bands, and long coat are still retained, but the cap has long since been discarded for the bare head, and the yellow petticoat was abolished in 1865. The school takes boys from the age of 9 to 11, and retains them till 15, 16, or 17, aiding them to start in life upon leaving. Boys who rise to the rank of Grecians remain longer, and are enabled to go with exhibitions to Oxford or Cambridge. Including the Preparatory School, which has been removed from Hertford to Horsham, there is accommodation for 820 boys. The girls' school removed from London to Hertford in 1778, has accommodation for 280 girls. The government is vested in the Lord Mayor, the Aldermen, and twelve Common Council men, and about 200 donors of £500, but the management rests with the Council of Almoners. The institution possesses an income of about £55,000 a year net for school purposes, besides large sums for exhibitions to the universities, apprenticing, etc., and possesses some church patronage. Some of the original buildings were burnt in the Great Fire, and rebuilt by Sir C. Wren.

The buildings which used to be in Newgate Street, designed by Mr. Shaw, were erected in 1825-1832. The education is partly classical and partly modern. Connected with the Hospital are several eleemosynary charities, including a large charity to the aged blind. Many notable men have proceeded from Christ's Hospital, among them Coleridge and Lamb.

Chromates. These substances are the salts of the acid known as chromic acid, H_2CrO_4 , or compounds of metallic oxides with chromic oxide, CrO_3 . The normal chromates are analogous to the acid above as, K_2CrO_4 , the salts known as *bichromates* or *dichromates* contain a double proportion of the chromic oxide, as $\text{K}_2\text{Cr}_2\text{O}_7$. They are an important series of bodies, many of considerable practical importance; they are all coloured, varying in hue from yellow to dark red. Potassium bichromate (red, triclinic system) is largely manufactured from chrome iron ore, and is used for preparation of the other chromates, in dyeing, in photographic printing (carbon process), and for a variety of other purposes. Lead chromate, PbCrO_4 , occurs native as crocoisite, and is artificially prepared for use as the pigment *chrome yellow*, a basic chromate Pb_2CrO_5 is known as *chrome red*, and a mixture of these two forms *chrome orange*. Other chromates are largely employed for scientific purposes in the chemical laboratory.

Chromatic Scale, in *Music*, signifies a scale of semitones, involving tones which do not belong to a diatonic scale.

Chromic Acid, H_2CrO_4 , forms red crystals by cooling a solution of chromium trioxide, CrO_3 . This latter substance is also frequently known by the name of the acid, and it is prepared by the action of sulphuric acid on potassium bichromate, and forms long scarlet deliquescent crystals. It is a very powerful oxidiser, and is much used as such in organic chemistry. A dilute solution is also used largely in microscopic work for the purpose of staining and hardening animal tissues.

Chromite, **CHROMIC IRON**, or **CHROME IRON ORE**, is an oxide of chromium, aluminium, iron and magnesium. It is hardly fusible alone, but with borax gives a chrome-green bead. It crystallises in regular octahedra, but is more commonly massive, sub-metallic, black, opaque, brittle, and sometimes magnetic. Hardness=5.5. Specific gravity=4.3 to 4.5. Chromite occurs chiefly in serpentinites and other rocks rich in magnesia, and is the principal source of the salts of chromium.

Chromium (Cr., atomic weight, 52.1), a metallic element, of which the chief natural compound is chrome iron ore, $\text{FeO} \cdot \text{Cr}_2\text{O}_3$. It also occurs in chrome ochre, crocoisite and some other rare minerals. The colour of emerald and the green in serpentine are due to small quantities of this element. It is a very hard metal of a grey or greenish colour, with a specific gravity 6.8. It forms three oxides, CrO , Cr_2O_3 , and CrO_3 . Two series of chromium salts exist corresponding to the two first, but the highest oxide has an acid nature and yields the *chromates*. The chromic oxide, Cr_2O_3 , is

used in preparation of green glasses, enamels, etc., and as a pigment under the name of *emerald green*. Combined with water it is also known as *Glauber's green*. The salts of all yield solutions coloured green or violet, and many show a remarkable change from the one tint to the other by warming. A double salt of chromium and potassium sulphate is known as *chrome alum* ($\text{K}_2\text{SO}_4 + \text{Cr}_2(\text{SO}_4)_3 + 24\text{OH}_2$). This forms dark purple octahedra, largely used in calico-printing, dyeing, and tanning.

Chromosphere. [SUN.]

Chronicles, two books of the Bible which repeat in some degree the contents of the 2nd Book of Samuel and the Books of the Kings, though written from a different point of view, i.e. Levitical instead of Prophetical. They are considered to be of about 330 B.C., and the books of Ezra and Nehemiah are thought to be continuations of them. The Hebrew name for them is *Events of Days*, that of the Septuagint, *Paraleipomena* (things left out), and by Jerome they are called *Chronicon*.

Chronogram, a device by which certain letters in a name or inscription are made to represent a date, and are printed in different type from the remainder. The thing originated in later Roman days, and was revived at the Renaissance. An example is a motto adopted by Gustavus Adolphus, $\text{ChrIstVs DVX, ergo trIVMphVs}$, which gives the date 1632.

Chronograph (*time-recorder*), a contrivance used for the accurate measurement of periods of time. Thus in races Benson's chronograph is often employed; an instrument by which the beginning of the period and its close may be instantaneously and automatically registered upon a dial. A favourite type is a paper-covered cylinder revolving regularly, upon which the given moments are measured by the interruption of an electric current. The chronograph has been employed to mark the transit of a star in two different places, telegraphic communication enabling the two to be instantaneously compared. The velocity of projectiles may be measured by a chronograph composed of screens placed at varying distances from the gun's mouth, the passage through each screen breaking an electric current and marking itself.

Chronology is the science of computing the lapse of time by observation of the periodical movements of the heavenly bodies. [CALENDAR.] The word is also applied to the arrangement of historically interesting events in the order of their sequence as taken from some one central event. [ERA.] It is difficult to realise in the midst of modern civilisation, with its provision of clocks, calendars, and books of reference, that the idea of time is by no means simple. Time is to the individual a subjective idea, to be measured not by the beat of a clock, but by the intensity and variety of emotions. To the schoolboy the holidays pass more quickly than the school term, and every one knows how quickly time flies if a task has to be accomplished by a given moment. The idea of

time, then, like the cultivation of memory, is the growth of civilisation. Jacky, the savage, in *Never Too Late to Mend*, admires the white man's power of being able to look a long way backwards. Chronology may be described as the objective view of time. The ancient methods of computing time were vague. The Greeks computed their time by Olympiads, i.e. in groups of four years, each of which group was marked by the recurrence of the Olympic Games (q.v.). The Romans, again, dated by the consuls, and sometimes from the supposed year of the foundation of Rome. Their lives they would measure by *lustrums*, periods of five years. Christendom, for the most part, dates events backward and forward from the supposed moment of the birth of Christ, which is generally put at the fourth year of the 194th Olympiad. But here scientific and ordinary chronology present a discrepancy, since the one represents the year of Christ's birth by a cipher, and the other as the first year. The Greek Church counts time in a way differing from that of the West; the Mohammedans date from the flight of Mohammed; and the Jews have their own method of computation. The question of intercalated days, which are rendered necessary by the earth's motions not fitting in with the exactly rounded periods of years, comes more naturally under the head of CALENDAR. The French, during the revolution at the end of the 18th century, endeavoured to inaugurate a new system of chronology, but this never really took root.

Chronometer. An instrument for measuring time, but especially a watch-like instrument for measuring it with great exactness in order to facilitate astronomical, nautical and other observations. It is distinguished by exceeding delicacy of construction, and by various compensations to counteract the effect of temperature on the particular parts upon which it is affected by cold. This accuracy is maintained on a ship at sea, there being no chronometers, and the time is ascertained before sailing. The use of such chronometers is so general that it is obvious that, if a clock is set at Greenwich and carried elsewhere, the observer will be able to determine by comparison the difference between the observed time and the true time. It is he happened to be at sea, and the clock was the only one of the kind. The modern chronometer was the great discovery of Thomas Mudge, and was made in the 18th century.

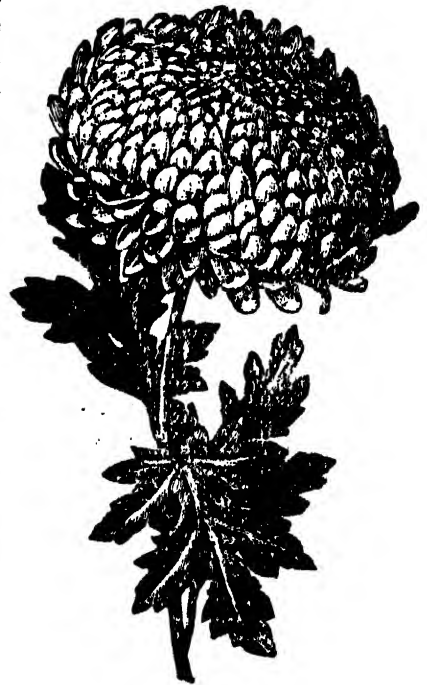
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order to determine the proportionate degree of refraction.

Chrudim, a fortified town of Bohemia, 62 miles S.E. of Prague, on the river Chrudimka. It contains an ancient church, a convent, and a high school. Large horse-fairs are held here, and cloth is manufactured.

Chrysalis, an insect in its resting or pupal stage, that which intervenes between the caterpillar and the perfect insect. When the caterpillar is mature, it prepares for itself a kind of case, known as the cocoon; this is usually made by the spinnerets or spinning organs. After the last moult the insect enters into the resting stage during which the adult form is perfected. In some cases, however, as in the *Muscidae* (including the housefly), the chrysalis retains the last larval skin. The appendages of the caterpillar are often modified into the corresponding parts of the adult, but in other insects this is not the case: thus in the housefly (*Musca domestica*) the head and thorax are not developed until the chrysalid stage. The life of the chrysalis is maintained by the consumption of the food stored up in the "fat body" of the caterpillars. The habit varies greatly with different species: in some cases they are hung up in very exposed positions on trees or shrubs, to which they are suspended by one end by a belt round the middle, or in other ways; or they may be hidden in clefts of trees or buried among roots.

Chrysanthemum, the name of a genus of *Compositæ* containing the common English ox-eye daisy (*C. leucanthemum*) and corn marigold (*C. segetum*). The name is, however, more commonly applied to the variable and beautiful species, long cultivated in China, and of late years immensely improved by selection in English gardens, which belongs strictly to the allied genus *Pyrethrum*, *P. sinense* being its technical name. The cultivated varieties vary considerably in the form of the leaf, which is generally somewhat mealy, and few, if any, of our garden flowers present an equal range of colour. In



CHRYSANTHEMUM.

form, owing to the elongation of the tubular disk corollas ("quilled"), the asymmetric enlargement of those of the ray ("dragon") and other modifications, we get an almost equal variety; and this variability, coupled with the facts of their flowering

in November and December, and their hardiness, fully accounts for their growing popularity.

Chryselephantine (Gk. *gold and ivory*), a kind of statuary employed by the ancient Greeks, especially in the case of large statues. The method was to make the framework of the statue of clay or stone or other material, and to overlay it with accurately fitting plates of ivory to represent flesh and plates of gold to represent raiment. These plates could be detached, as, for instance, from statues only used occasionally in religious ceremonies. Famous examples of this statuary were the Olympian Zeus and Athene of the Acropolis, the work of Phidias. The Chryselephantine method was reserved for statues of the gods, and much offence was given by the Macedonian kings, who employed it for their own statues.

Chrysippus was born at Soli in Cilicia about 280 B.C. Having lost his patrimony he came to Athens, and studied philosophy under the Stoic teacher Cleanthes, and possibly under his master, Zeno. He acquired much learning, which, added to his natural acuteness and subtilty, caused him to be regarded as the main pillar of the porch. Of his voluminous but obscure writings we have only fragments. Like others of his school, he regarded ethics as the only science of importance, but he does not appear to have considerably advanced Stoical doctrine by introducing a class of indifferent things between the rigid limitation of good and evil adopted by his predecessors. He conceived the physical universe, including man, to be permeated by the universal soul or God, into which at death all individual souls are absorbed. Physical evil he repudiated, and moral evil he looked on as the necessary complement of good. He devoted much attention to formal logic, drawing up a scheme of the categories, and elaborating the hypothetical syllogism, to which he gave preference as the type of reasoning. He affected much the use of the Sorites or "heap of Chrysippus." His chief opponent was Carneades. He died in 206 B.C.

Chrysoberyl, an oxide of aluminium and beryllium ($\text{Al}_2\text{O}_3\text{BeO}$), occurring as a transparent green gem. It crystallises in the prismatic system, often in six-sided or stellate twins; has a vitreous lustre and a colourless streak, and is unaffected by acids, and with great difficulty fusible even with fluxes. Hardness = 8.5. Specific gravity = 3.6 to 3.8. A yellowish variety is known as *oriental chrysolite*; one with internal chatoyance is known as *cymophane*; and one green by sunlight and red by candle-light, as *alexandrite*.

Chrysolite, the transparent variety of olivine (q.v.), (MgOFeO)₂, SiO_2 , of a pale green or yellow colour with a vitreous lustre, colourless streak, and conchoidal fracture, crystallising in the prismatic system, and sometimes occurring in the Levant in masses of considerable size. It is often known as a gem by its French name *peridot*. Hardness = 6 to 7. Specific gravity = 3.3 to 3.5.

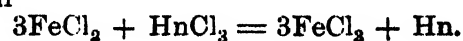
Chrysoloras, MANUEL, born at Constantinople about 1355, of high family, was early employed by John Palæologus to implore the aid

of the Christian princes against the Turks. In 1395 he was invited by the Florentines to teach Greek in that city. He afterwards visited Pavia, Milan, and Venice, and then, on the invitation of Aretino, secretary to Pope Gregory XII., settled in Rome. He was sent by the pontiff in 1413 to arrange with the Emperor Sigismund the assembling of the council of Constance, and on his way to attend the first meeting in 1415 he died suddenly. His *Erotemata*, a Greek grammar, was long in use, but only one of his other works has been printed.

Chrysoprase, the apple-green variety of chalcedony (q.v.), owing its colour to nickel oxide.

Chrysostom, ST. JOHN (Gk. *Chrusostomos*, golden-mouthed), was born of an illustrious family at Antioch about 347 A.D. He was training for advocacy in the school of the sophist Libanius when the influence of his mother, Anthusa, led him to adopt a life of piety. After six years spent as a hermit in the wilderness his state of health compelled him to return to Antioch, where he was ordained (381), and speedily became so famous for his eloquence that on the death of Nectarius he was in 397 appointed Archbishop of Constantinople. His charity and piety won him the love of the populace, but a quarrel with Theophilus, Bishop of Alexandria, who was supported by the Empress Eudoxia, led to his banishment. To appease the people he had to be recalled, but his opposition to the erection of the Empress's statue almost within the precincts of St. Sophia again provoked his wrath. He was exiled to a convent at Cucusus on Mount Taurus, whence, as his influence still made itself powerfully felt in the capital, he was relegated to Pityus, near the Euxine, but died at Comana on the way (407). His remains were transported with great pomp to Constantinople by Theodosius, and are believed to have been carried thence to Rome. The Roman Church celebrates his feast on January 27, but November 13 is his day in the Greek calendar. His teaching tends to asceticism and now and then to mysticism, but breathes a spirit of broad charity. In his exposition of the Scriptures, to which he attached great weight, he is intelligent and practical. His homilies, liturgies, and other treatises are of value in themselves as illustrating the history of his times. Among the many editions of his works the finest is that brought out by Sir Henry Savile, Provost of Eton, in 1612 at a cost of £8,000, an enormous sum in those days.

Chrysotype, a photographic process, introduced by Herschel, and employed for the production of a "positive" print from a "negative." Paper is washed with a solution of ferric ammonium citrate, and dried. To obtain a print it is sufficiently exposed to light beneath a negative, and then "developed" by a solution of gold chloride and well washed. By the action of light the ferric salt is reduced to a ferrous, and this acts upon the gold chloride with formation of metallic gold which forms the image, which is of a blue colour. The action of ferrous salts may be represented by the equation



Chub (*Leuciscus cephalus*), a common English and European freshwater fish of the carp family. It is fairly abundant in the Thames, but rarely attains a weight of more than 5 lbs., and is little esteemed as a food-fish. The colour is brownish-green, paler on the sides, and white beneath; the tail and lower fins reddish. In America the name is given to the allied genus *Ceraticthys*, and to *Leucosoma corporalis*.

Chubat, or CHUPAT, a Welsh colony of Patagonia, taking its name from the river that flows through it. The entrance to the river is 600 miles south of the river Plate, and admits vessels of from 7 to 12 feet draught. The Welsh-speaking settlers arrived in 1865, in 1867 they abandoned the colony, but subsequently returned, and in 1871 were shut off for twenty months from the outer world. The principal town is Trerawson, five miles from the sea. The products are English grains and roots and salt. A railway of 40 miles to New Bay has been projected. A president and council administer the colony.

Chubb, THOMAS (1679–1746), an English Deistical writer, born near Salisbury. Being left in poverty by the death of his father he was apprenticed to a glover, and then was employed by a tallow-chandler, and for many years his living was derived from these sources. His first work, *The Supremacy of the Father Asserted*, was published in 1715, and in 1730 many of his tracts were collected and published. Sir Joseph Jekyll, Master of the Rolls, took an interest in him and received him as a clerk in his office for several years, though in 1734 he was ejected. In later times he was employed by the government, where he pursued his favourite studies. His works are *A Discourse Concerning the Nature and True Gospel of Jesus Christ*, 1734, and *Posthumous Works*, 1746.

Chuck-Will's [CHUCK-WILL.]

Chudes, a Finnic language, formerly widely diffused over the north of Europe, but now mostly confined to the surrounding Russian territory. It is a distinct Chudic language spoken by the Finns in the north, and the Welsh in the south, and with Carelian, Tavares, and others, forms the westernmost branch of the Finnic family. Chude is the name of the Finns in the original language, and is also the name of the same people in the Finnish intermediate languages.

Chukchi, a people living on the coast between the Bering Sea and the North Pacific Ocean, and north of the Bering Strait. They are tall, lean, and cephalic, and altogether form a distinct people. Some of them are said to be of the Mongol race, and some of the Finnic. The language is said to be of the Finnic type. Two divisions are mentioned, the Chukchi and the

Reindeer Chukchi more inland. Chukchi is stated to be the Russian form of the national name *Chauktu*, meaning "men;" but Hooper gives the true form as *Tuski*, meaning "brothers" or "confederates" (*Ten Months among the Tents of the Tuski*).

Chunar, an ancient fortified town of India on the south bank of the Ganges, in the district of Mirzapur, in the North-West Provinces. The fort, on a summit commanding the river, contains the remains of a Hindu palace with some interesting carvings. Warren Hastings here made a treaty in 1781 with the Nabob of Oudh.

Chupra, a town in the province of Behar, Bengal, extending about a mile along the north bank of the Ganges. There is a large trade in cotton, saltpetre, and sugar.

Chuquisaca, more commonly known as Sucre, is the capital of Bolivia, and is on a tributary of the Pilcomayo, on a table-land 8,800 feet above sea-level. The climate is mild, and many of the miners of Potosi spend the winter here. The inhabitants are mostly a mixed race of Indians and Spaniards. The name is that of an ancient Peruvian town which occupied the same site. The present town, founded in 1539, was at first called Ciudad de la Plata. The name Sucre is derived from a general who fought in the last battle of independence in 1824. The town is the seat of an archbishopric, and has a fine cathedral, as well as a university and a hospital.

Church (Gk. *kuriakē*, from *kurios*, lord) means, etymologically, a body of people acknowledging one and the same head. Generally it is used to denote, according to the formulary of the English Church, "all those who profess and call themselves Christians." In a wider sense, the word includes not only those who are Christians, but also all the departed who have died Christians, and in this sense the Church is divided into the Church Triumphant and the Church Militant here on earth. But from an early period the name was applied in a much more restricted sense, since Scripture speaks of the seven churches. And so in modern times the name has come to be applied to an endless number of sects, more particularly to such as hold with episcopal authority, though the term is by no means restricted to such. The articles of the Church of England use the word in this sense, when they say "Churches may err and have erred." The expression "the Jewish Church" shows that Christianity is not essential to a church. Sometimes the word is used to distinguish the clergy from the laity, and a man who receives orders is said to enter the Church, and formerly a "Churchman" was a priest or monk, as, in the ballad of King Canute, "Row near the shore, knights," said the king, "and let us hear these churchmen sing." As popularly applied to a building for public worship, the word is so loosely used that it would be difficult to say what is or is not a church. [CHAPEL.]

Church, RICHARD WILLIAM (1815–1890), an English clergyman and noted man of letters. After spending much of his youth on the Continent

he entered at Oxford and was elected fellow of Oriel College. In 1853 he was presented to the rectory of Whatley, and in 1854 his *Essays and Reviews* established his reputation as a gifted and scholarly writer. He produced many works, some of the most esteemed among them being a *Life of St. Anselm* (1871), an essay upon *Dante, Spenser, and Bacon* in the "English Men of Letters" series, and many occasional essays. From 1871 till his death he was Dean of St. Paul's.

Church, STATES OF THE, were certain states of central Italy, ranging from Ancona and Ravenna on the Adriatic coast, and extending to the Mediterranean, having Rome as their capital, which formerly were in the temporal jurisdiction of the Pope. Taking their rise in a gift of lands made to the Pope by Pepin le Bref in the 8th century, these states have differed in extent from time to time. Shorn of much of their proportions in 1860, they finally ceased to exist, except as regards the Vatican and its surroundings, in 1870.

Church Discipline. In the ancient Church, which was a voluntary society, the sanctions were moral, as they are again in modern times, and depended for their efficacy upon the conscience of the individual Christian. Excommunication—which was a kind of religious boycotting—meant nothing to the man who was content to forego Christian society. But when the State adopted the Church and gave force to its decrees, Church discipline came to have a real meaning. For instance, the Inquisition was a real and formidable power to those who questioned the Church doctrines, and many a proud monarch was brought to listen to the voice of the Church when his kingdom was placed under an interdict, *i.e.* a sentence of general excommunication. Till comparatively recent times men were put to open penance for breaches of Church discipline, and though in the Church of England discipline is almost in abeyance so far as the laity are concerned, excommunication is looked upon as a possibility, since a rubric forbids the use of the Burial Service over such as die excommunicate. The Scottish Church still retains a certain amount of discipline over its lay members. But in the English Church it may generally be said that discipline only exists for the clergy, and even for them its limits are very undefined. Except in the case of gross breaches, it depends for its efficacy in a great measure upon the offender's regard for the obligation of his oath of canonical obedience. In some respects the law of the land still enforces the decrees of an ecclesiastical court, but the procedure of these courts, and the curious manner in which their jurisdiction could be applied, made their almost entire abolition a necessary and welcome measure.

Church History. The history of the Christian Church is divided into three principal epochs. The first, the *Ancient*, begins with the foundation of the Church on the Day of Pentecost (Acts ii.), and lasts till the establishment of the Carolingian dynasty. From that date to the Reformation in the 16th century is the *Medieval* period; and then succeeds the *Modern*. The historians who record the history

of these periods are, first, those who were eye-witnesses of the events they record, or who lived within comparatively short distance of them; and, secondly, those who have compiled their narratives from records and memorials of the past.

I. THE ANCIENT EPOCH. The earliest book of Church history is the Acts of the Apostles, written, according to the universal tradition of early times, by St. Luke. This book does not contain the history of the work of the twelve Apostles, but confines itself to two main subjects—the foundation of the Church at Jerusalem and its organisation there, and the first beginnings of the evangelisation of the Gentile world, begun with the conversion of Cornelius and the extension of the Church to Samaria and Antioch, but carried on with marvellous success by St. Paul and his companions. From the close of the Acts till the next book of Church history there is a large gap, though the materials for the compilation are many. The Christian writings of the age immediately following the Apostles are mostly of a practical and hortative character, and these throw continual side lights on Church history. A few words should be said about these writings. We have first the *Apostolical Fathers, Epistles of Ignatius, Polycarp, and Clement of Rome, The Visions of Hermas, and the Epistle of Barnabas*, the genuineness of which, as a writing of the companion of St. Paul, is very doubtful. The chief value of these writings is the evidence which they furnish of the acceptance by the Church at the beginning of the second century of the New Testament writings. A little later there arose an "Apocryphal Literature," a collection of spurious Gospels and Epistles, written to propagate the Gnostic and other heresies. The Apologetic works of Justin Martyr and others were addressed to the unbelieving world in defence of the Faith which had now diffused itself so largely through the world, and was beginning to excite suspicion, fear, and hatred. Many of the Apologies have been quite lost, and of some only a few fragments remain.

The bitterest persecutions by the Imperial power of Rome began in the second century, and continued with intervals of repose till the year 311, when the conversion of Constantine was followed by the establishment of Christianity as the religion of the Empire. The two fiercest persecutions were those of Decius and Diocletian. Of the ten usually enumerated, several were only local. Simultaneously with these, a new philosophy—Neo-Platonism, the expiring effort of Gentile wisdom—attempted the construction of an eclectic system intended to supersede the Christian faith, and to re-interpret, in a theological and philosophical sense, the myths and traditions of Paganism. It was encountered by the formation of the magnificent Christian literature and theology of Alexandria. The greatest father of this school was Origen, a brilliant Biblical critic and scholar. The second great name is that of Clement of Alexandria. The West soon followed, though Latin Christian literature began, not at Rome, but at Carthage with Tertullian. Clear differences of view are manifest from the beginning between East and West. In the Alexandrian divines there is great boldness of speculation and love of

Learning revived in the West in the eleventh century in the form of Scholasticism, and in 1120 began a great revival of Greek literature under the

Comneni. In England we have valuable historians: —Eadmer, Abbot of St. Alban's (*Hist. Novorum*, 1066-1112); Ernulf, Bishop of Rochester (*Textus Roffensis*); Simeon of Durham, flor. 1130 (*Chronicles*, etc.); Geoffrey of Monmouth, d. 1138; William of Malmesbury (*De Regibus Anglorum*); Florence of Worcester, d. 1118; Henry of Huntingdon, c. 1150; William of Newbury, d. 1208; John of Salisbury (*Polychronicon*); Roger of Hoveden (*Hist.*, 731-1202); Caradoc, d. 1157 (*History of Wales*).

Under Innocent III. the Papal power reached its height. Then it began to decline, though the pretensions of Boniface VIII. were higher than those of any of his predecessors. The system had done a good work in drawing to the Gospel the rude tribes of Central and Northern Europe, in keeping the Church independent of the State, and in collecting and transmitting ancient learning. It was a schoolmaster of the nations, and when it had done its work their pupilage ceased. It diffused the culture which ultimately undermined itself. In doing its proper work it attempted much more, and when it found that spiritual weapons were unavailing, it resorted to craft and coercion. Nor was this all. Instead of the old Catholicity there were novel usurpations. Intolerable exactions drained the gold from the European States, simony became a system, the traffic in Indulgences became so shameless as to kindle the wrath of Europe. St. Bridget said, in her time, that at Rome the whole Decalogue was abridged into one precept, "give gold," but it was worse after her. The Papacy became a byword for shameless nepotism. And when, in addition, protests made against these evils were met by the Inquisition, it was evident that a searching and far-reaching reform was called for. In England the great name of Wiclif is identified with a movement in this direction.

This led to the great councils which are distinguishing landmarks of the fifteenth century. They failed to carry through any real reforms, the popes being too astute to suffer them, and a Protestantism began to course through the mind of universal Christendom. It was helped first by the invention of printing, which diffused among the people the culture which had been confined to the clergy and to kings' courts; and secondly, by the revived study of Greek and Roman literature, extended though not occasioned by the fall of Constantinople. This opened up the sources of Christian history, and drew back the veil which had long hidden primitive Christianity and the sacred Scriptures. The Papacy began to be suspected of lacking the historic base on which all its assumptions rested. Then, again, the old feudalism in nearly all the European states had given place to vigorous monarchies which consolidated the nations. This was a heavy blow to Papal pretensions.

The fifteenth century witnessed the decline of the scholastic learning, and the rapid growth of a reforming literature accompanied with the classical revival to which we have just referred. The names of Platina (died 1481) (*Lives of the Popes*), Froissart, Philip de Commines, Guicciardini, are noteworthy among historical writers. Wiclif and Huss were

reforming writers, hostile to traditional beliefs; and Gerson, Chancellor of the University of Paris (died 1429), Savonarola (died 1498), were also earnest reformers on Church basis. The *Imitatio Christi* of Thomas à Kempis may also be classed among real works for reformation. The great Papal schism had terribly weakened the Church, but had been healed. Nevertheless, good men saw that nothing had been done to reform abuses. The fifth Lateran Council (1512 to 1518), convoked by Julius II., demonstrated the impossibility of reform without upheaval. It may be regarded as the last movement of the Mediæval period. When its sessions were opened Luther was twenty-nine years old, Zwingli twenty-eight, Calvin three. The preparations for the great change had been going on in all the spheres of life. But the parties as yet had no common principle or great leader. The authority of Mediævalism was broken, but the rallying note of the New Order was not yet sounded. Even at Rome there was no faith in the old system. Erasmus wrote, "At ego Romæ his auribus audivi quosdam abominandis blasphemiiis debacchantes in Christum et in illius Apostolos."

III. MODERN EPOCH. Modern History begins with the Reformation of the sixteenth century. Its causes, as we have seen, run back two centuries, into the heart of the Middle Ages; its warrant was found, not merely in the needs of the European peoples, but also in the Scriptures and in the best traditions of the Christian Church. The moving cause was not opposition to the Papacy; it was a deeper spiritual experience, a sense of sin and of the need of deliverance. By the Reformation Christendom was divided into two main parts, the Roman Catholic and the Protestant. Southern Europe adhered to the former, North and North-West to the latter, the Centre being divided. It may be said that no Celtic race accepted the reform. So widespread was the sense of the need of reformation, that during the first forty years of the movement more was gained than was retained. A reaction, headed by the Jesuits, succeeded in bringing back France and South Germany to the Mediæval Church. But the Reformation was planted in the most free and advancing nations of Europe, and its greatest triumphs have been with these. But even Roman Catholics admit that the reform movement brought back life into their own Church, and caused it to put forth its energy with greater force and concentration. It must be noted that the discoveries of Columbus had added a new continent to the civilised world. Of this continent South and Central America became Roman Catholic and North Protestant, except Lower Canada and Louisiana.

The Reformed Churches on the Continent were divided into two main portions, the *Lutheran*, or "Reformed," and the *Calvinistic*, or "Evangelical." In England the ancient Episcopal constitution was preserved, but, so far as related to doctrine, the sympathies of the leading Reformers leaned towards Calvinism. At the commencement of the Reformation the three great powers were Charles V., Francis I., and Henry VIII., and the national struggle in Europe was respecting the supremacy

of France or Spain. Italy was the chief battle-field of that struggle. Monarchical absolutism was at its height. Then came the disastrous Thirty Years' war, in which was seen the strange fact that Cardinal Richelieu, in order to humble the pride of Germany, sided with the Protestants who were struggling against Imperialism. That war was ended by the peace of Westphalia in 1648, which established the political rights of the reformed churches and princes of Europe. All of the great Confessions of Faith had now been written. The Reformation was an accomplished fact, the struggles of the Church from that date were against the Deism of England, the Pantheism of Germany, and the Atheism of France.

The literature of the Reformation Period was immense in quantity, for in this respect printing introduced a revolution, bringing all the points of controversy before the public mind. In 1523 Luther published 183 works; other reformers, 122; the other side only twenty. Calvin was the father of the modern system of Biblical criticism. He was a far better scholar than Luther, had great organising power and logical acuteness. His works were published in 12 vols. folio at Geneva in 1556. In English they make 52 vols. The impetus given to the study of the Scriptures by the Reformation is shown by the manifold editions of them. The Complutensian Polyglot was published in 1520; Erasmus' New Testament (the first edition printed in Greek) in 1519; Luther's German translation, 1523 to 1532; the English version of Cranmer in 1538, and several versions followed it, ending with the present Authorized Version, 1611. Then, along with a splendid literature, came the days of Elizabeth, the writings of Hooker, and the beginning of a religious revival. There are some of the great names of the seventeenth and eighteenth centuries. Bishop Jewell, Geo. Herbert, Andrewes, Bishop Hall, Chillingworth, Bramhall, Bishop Jeremy Taylor, and Latimer, Archbishop Leighton, Hooker, and Pearson, Bishop Bull, Bishop Burnet, John Bunyan, Baxter, Cyprian, Henry Doddridge, Hickes, Isaac Newton, and Archbishop Potter, Lardner, Warton, and Bishop Warburton, Toplady.

Of Church history in England—Thomas Burnet (*History of the Present and Future of England*), Henry Hallam (*History of the Literature of England*), Henry Hallam (*History of the Literature of England*), Rymmer (*History of the Literature of England*), Pearson (*History of the Literature of England*), Canon Stillingfleet (*History of the Literature of England*), His Grace of Devonshire (*History of the Literature of England*), Fatherless (*History of the Literature of England*), (On the *History of the Literature of England*), Chapman (*History of the Literature of England*), (Com in *History of the Literature of England*), Gibson (*History of the Literature of England*), (Con *History of the Literature of England*), (Hist *History of the Literature of England*), French (*History of the Literature of England*), period *History of the Literature of England*.

Eccl.), Daillé (*De Usu Patrum*), Oudin (*De Script. Eccl.*), Benoit (*Edict of Nantes*), Lenfant (*Councils of Fifteenth Century*), Beausobre (*Manicheans*), Le Sueur (*Eccl. Hist.*). In Holland flourished Spanheim, Basnage, Le Clerc; and in Germany lived the illustrious Mosheim and Semler. Roman Catholic Church historians were Bossuet, D'Achery, Mabillon, Martianay, Martene, Montfaucon, the Benedictines of St. Maur, Harduin, Ruinart, Cotelierius, Baluze, Maimbourg, Le Cointe, the authors of the *Acta Sanctorum*, Du Pin. Launoï, a Sorbonnist (*Le Dénicheur des Saints*), though remaining in communion, vigorously attacked legends of the saints, the Immaculate Conception, and defended Gallican liberties. Fleury, who wrote an ecclesiastical history in twenty quarto volumes, was also a strong Gallican. Tillemont was the great Jansenist historian.

The English Revolution against Charles I., the establishment of a Commonwealth for twelve years, followed by a reaction in favour of monarchy and the Restoration of the Stuarts, had permanent effect upon the English nation. Though the people gladly restored the monarchy, much of Puritan teaching had entered into their souls, and remains with us still. Unhappily the Stuarts had not learned wisdom in exile, and the shameless immorality of Charles II. led to a terrible deterioration in the national character. And thus the 18th century opened with many discouraging features. France was given over to infidelity, Germany to rationalism, England to indifference. The Roman Catholic Church had lost its hold on the educated classes. Politics and philosophy were the great interests. It is sadly significant that the first great attempt in England to estimate the effect and influence of Christianity as a factor in the history of mankind was that of Gibbon in his *Decline and Fall of the Roman Empire*. He is the founder of the great school of English history, and his name as historian still remains the greatest, but he was an infidel. And the philosophical writings of his contemporaries are honeycombed with Rationalism and Arianism. The outcome, so far as France was concerned, was the terrible Revolution of 1789. The saviours of England from a similar catastrophe were Wesley and Whitefield, to whom were owing the revival of practical piety in England and the great evangelical movement which followed. The names of Wilberforce, Simeon, Bickersteth, Bradley, Melvill, are all illustrious in this connection. The reaction against the want of ecclesiastical doctrine and discipline in this party led to a counter-movement commonly known as the Anglo-Catholic or Tractarian, the latter name being derived from the *Tracts for the Times*, in which its principles were advocated (1833-1841). The leaders in this movement were John Henry Newman, Richard Hurrell Froude, Dr. E. B. Pusey, John Keble, Hugh James Rose. The first-named of these joined the Church of Rome in 1845, and after many years was made a Cardinal by Pope Leo XIII. The secession of Dr. Newman was for a few years a check to the Tractarian movement, but it revived under the care of Keble and Pusey. An attempt made to enforce its views on Baptismal Regeneration led to

the *Gorham Case* in 1847 *seq.*, and the attempt failed, in consequence of which several of the leading men in this party, Manning, Maskell, H. W. Wilberforce, and others, joined the Romish Church.

The publication of *Essays and Reviews*, a collection of writings, most of which were rationalistic, led to an attempt to expel two of the writers, but this also failed, and the comprehensiveness of the Church of England was secured. The principal parties within it are generally reckoned as High (the advanced wing of which is known as Ritualistic), Low (the old Evangelical), and Broad. The latter contains many grades. In its ranks have been reckoned Coleridge, Arnold, Jowett, Maurice, Hare, Kingsley, Macnaught. Some of them vigorously refused to be reckoned in this party, and certainly Jowett, Maurice, and Arnold held widely different views. They were all pious, learned, and earnest men, but while Arnold was largely in sympathy with the Low Churchmen, so was Maurice with the High, while Jowett has much affinity with the German Freethinkers.

The publication of the work entitled *Lux Mundi* marks the beginning of a new school, in which the free criticism of the letter of Scripture is united with a strong belief in the authority of the Church and Creeds.

One of the brightest features in the aspect of the religious movements since the Reformation has been that of missionary enterprise. At first the Roman Catholics took the lead, under the impulse of the newly-formed Order of Jesuits. The Orphan House of Halle undertook Lutheran missions in the East, and the Society for the Propagation of the Gospel, founded under King William III., led the missions of the Church of England. But at no period since the first century of the Christian era has the missionary growth of our holy faith been so auspicious as now. £2,000,000 are expended yearly in this work by Protestant societies. The Roman Catholic missions under the Propaganda spend about £200,000 a year.

Rationalism in Germany began in the 18th century, reason being made the ultimate arbiter of truth in contrast with revelation ("supernaturalism"). In criticism and theology Paulus and Strauss carried Rationalism to its extreme consequences. By his appeal to a specific Christian consciousness Schleiermacher broke the power of Rationalism as to doctrines, though in Biblical criticism he yielded to many of its conclusions; his influence has greatly shaped subsequent parties. The orthodox school of Lutheranism, represented by Olshausen, Neander, Dorner, Müller, has done great service by its depth of piety and its great learning.

In the Roman Catholic Church the doctrine of the Immaculate Conception was made an article of faith in 1854, and the personal infallibility of the Pope in 1870. A reaction against these dogmas resulted in the separation of a large number, the chief of whom was the great historian Döllinger, and these still form the communion known as the Old Catholics.

Among the writers on Church history of the nineteenth century may be mentioned Neander and

Gieseler in Germany, Renan in France, Schaff in America, and Robertson, Lightfoot, Westcott, Hatch, and Farrar in England.

Church Music, a term used to denote anthems, hymns, psalms, voluntaries, and the like—in short, any kind of music which, by reason of its solemnity, is considered fit to be employed in public worship. Opinions as to what is or is not fit for church music differ, and have differed, in different ages, countries, and churches. What is approved of, for example, in some foreign churches, would give the greatest scandal if employed in a Scottish Presbyterian church.

Church Rates. These are tributes for the expenses attending the reparation and necessities of the parish church. They are charged on all lands and houses in the parish, are assessed on the occupiers, and are made by the parishioners at large, that is, by the majority of the parishioners present at a vestry summoned for that purpose by the churchwardens. But they are not now, as a general rule, compulsory on the persons rated, and the only result of a refusal to pay them is a disqualification from interfering with the moneys arising from the rate. This important change in the law was effected by an Act passed in the thirty-second year of Victoria's reign, which recites as a reason for the abolition of their compulsory levy that "church rates have for some years ceased to be made or collected in many parishes by reason of the opposition thereto, and in many other parishes where church rates have been made the levying thereof has given rise to litigation and ill-feeling." This Act, however, did not interfere with church rates established by special local acts. In Scotland the expenses of maintaining the churches is borne by owners of houses in proportion to their rental value.

Churchill, CHARLES (1731–1764), an English satirist, who, after being educated at Westminster, and entered at Trinity College, Cambridge, brought his university career to a full stop by a Fleet marriage. He then read for the Church, and was ordained priest in 1756, and on his father's death in 1758 was appointed to the curacy and lectureship of St. John's, Westminster, but three years afterwards, his conduct, startling even for those times, drew upon him the censure of the dean, whereupon he at once resigned his appointment and threw off the clerical character. His first published poem, *The Rosciad*, a satire upon actors, and his *Apology*, an attack upon the critics of the *Rosciad*, came out in this year. In 1762 he published *The Night*, in which he apologised for separating from his wife, and *The Ghost*, in which he ridiculed Johnson. In the *Prophecy of Famine* he ridiculed the Scots, and his *Epistle to Hogarth* is said to have moved the caricaturist deeply. In 1764 appeared *The Times*, the last of his works of any merit, and in the autumn of the same year he went to Boulogne, where he died of a fever a few days after his arrival.

Churchill, LORD RANDOLPH, born 1849, the third son of the seventh Duke of Marlborough, was educated at Eton and at Merton College, Oxford. He entered Parliament as member for

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Chutia, a people of Upper Assam, generally classed with the Kachâri family, but are more probably a branch of the Miri, having reached the Assam valley from the north-east. They were dominant in Upper Assam till overthrown in 1350 by the Ahom invaders from Burma. Since then all have become Hinduised in speech and customs, except the Deori Chutias of the Lakhimpur district, who still preserve the old tongue, if not in conversation, at least as a "sacred language" (G. H. Damant).

Chutney, written also CHUTNEE (Hindoo, *chatni*), a kind of pickle combining hot, sweet, and acid elements. The best chutney is imported from India, but there is also a home-made chutnee used in England, of which apple, capsicum, sultanas, and other things are ingredients.

Chyle (Greek, *chulos*, juice), the fluid which finds its way into the lacteals from the alimentary canal during the process of digestion. The terminal lacteals take origin in the villi (q.v.) of the small intestine, and transmit their contents through conduits of gradually increasing size, until the whole lacteal system becomes united in the single *thoracic duct* (q.v.). This main trunk finally opens into the large veins of the neck. Thus the chyle absorbed from the alimentary tract is ultimately discharged into and mingles with the blood. Chyle is a milky fluid containing about 9 per cent. of solid matter (proteids, fats, extractives, and mineral salts). It differs from the lymph of the lymphatic vessels in containing more fatty and proteid substances than the latter. The fatty matter is in an extremely finely divided state, and is called the *molecular basis* of the chyle. It is derived from the fatty constituents of the food, but some uncertainty exists as to the process by which the particles of fat are absorbed from the alimentary canal and conveyed into the lacteals. Chyle is coagulable, and contains cells called chyle corpuscles.

Chyme (Greek, *chumos*, juice), the term applied to the thick fluid which passes from the pyloric orifice of the stomach into the small intestine. The chyme is, of course, the ingested food as altered by the various processes it has undergone up to the termination of gastric digestion.

Cialdini, ENRICO, an Italian soldier, born at Castelvetro in Modena in 1811. He studied medicine, but was forced to take refuge in France for taking part in the Revolution of 1831. After fighting in the Spanish service against the Carlists, he returned to take part in the Italian rising of 1848, and being wounded, fell into the hands of the Austrians. When released he was employed to raise a regiment of Sardinian volunteers, at whose head he fought in 1849. He commanded a division in the Crimean war; and in the war of 1859 he gained the victory of Palestro. In 1860 he gained a victory over the papal army, and took Gaeta and Messina in 1861. In 1862 he was obliged, as Governor of Naples, to act against Garibaldi. In 1866 he occupied Venice, and in 1876 went as ambassador to France. He returned with the rank of general of the army in 1881. He died in 1892.

Cibber, COLLEY (1671-1757), English actor, dramatist, and poet, was the son of a German sculptor whose work is still to be seen upon the pedestal of the Monument at London Bridge. He was educated at Grantham, and in his nineteenth year entered Betterton's company of actors at Drury Lane. He played in *The Orphan* and in *The Double Dealer*, and in 1696 he played in his own comedy of *Love's Last Shift*, and secured his reputation. In 1704 he brought out his *Careless Husband* for himself and Mrs. Oldfield, and in 1712,

when part owner and manager of Drury Lane, he brought out Addison's *Cato*. In 1715 he adapted the *Nonjuror* from Molière's *Tartuffe*, and on the death of Mrs. Oldfield, in 1730, followed by that of Wilks, one of his partners in the ownership of the theatre, he sold his share, and retired from the stage, having already been appointed Poet Laureate. An autobiographical *Apology for the Life of Colley Cibber* shows great merit, and if his powers as a dramatic writer were not great, at any rate he did much to elevate and purify the stage. He was severely criticised by Pope in the *Dunciad*, and spoken of with scorn by Johnson, who, however, approved of his *Apology*.

Cibrario, LUIGI (1802-1870), Italian historian and politician, was born at Turin, and studying the law, entered the State service, and soon became distinguished for his researches in history. At the Italian rising of 1848 he was appointed by Charles Albert commissioner at Venice, and senator of Sardinia. In 1852 he became minister of public instruction, and in 1855 foreign minister. Besides other works on history, numismatics, and different subjects he published (1839) *Economica Politica de Medio Evo*; *Storia della Monarchia di Savoia* (1840); and *Storia di Torino* (1847).

Cicadas, a number of insects belonging to the order RHYNCHOTA and forming the family Cicadidæ. They have suckorial mouths and four wings, and undergo an incomplete metamorphosis. The most interesting point about them is the presence in the males of the "abdominal drums" by which they make a harsh chirping noise. The female is songless; it has a piercing ovipositor, by which it bores into trees and there lays its eggs. Most of the Cicadas are tropical, but one species, *Cicada anglica*, Curt, occurs in England. They are usually known as locusts in America and Australia, but have no connection with those insects. The Cicadas include some of the largest of the Rhynchota.

Cicatrix (Lat. *cicatrix*, a scar), a scar. When an ulcerated surface heals there is a development of what is called scar tissue, or cicatrix tissue, and the process is termed cicatrization. In the case of a skin wound the epithelium grows and extends so as to cover the site of injury, but the normal appearance is never completely regained, and a scar, or cicatrix, remains to mark the situation of the original breach of surface. The tissue of the scar beneath the epithelium is eminently liable to undergo contraction, thus leading in some instances to the production of serious deformity.

Cicero, MARCUS TULLIUS (106-43 B.C.), Roman orator, statesman, philosopher, and man of letters. Born in easy circumstances at Arpinum in Latium, he went to school at Rome to learn Greek philosophy and literature, law and rhetoric, thus fitting himself by wide study for forensic pleading and political oratory. After making his *débüt* at the bar as advocate for the defence in a criminal trial, at the age of 26 he went to Athens, coming back at the age of 30 to take his place as leader of the Roman bar. In 76 B.C. he was quæstor in Sicily,

by pressing through coarse hair-cloth bags either immediately after crushing or after having previously been allowed to stand for a few days in open vats. The liquid so obtained is placed in casks and allowed to ferment for three to ten days according to the strength required; it is then poured off from any sediment into clean casks and stored in cool cellars. In the following spring the cider is again poured off and casked or bottled. Good cider generally contains from 5 to 10 per cent. of alcohol and about 2 to 3 per cent. of sugar.

Cienfuegos, a port on the S. coast of Cuba, 140 miles S.E. of Havana, with which it is connected by railway. It has a considerable trade in sugar, molasses, rum, and wax.

Cieza, a Spanish town twenty-six miles N.W. of Murcia.

Cigar, a form of preparation of tobacco for smoking made by tightly rolling tobacco leaf, from which the stems have been extracted, and enclosing it in an outer layer of closely-fitting leaf. The ordinary cigar has one end open, and the other closed and pointed. The cheroot, lunkah, and trichinopoly have both ends open. One variety of cigar is manufactured by winding the tobacco leaf thinly at the ends and thicker in the middle around a central straw.

Cigarette, a diminutive of cigar, is the name given to a kind of cigar made by packing, somewhat loosely, tobacco cut to a considerable degree of fineness in an open-ended tube of tobacco husk, or more generally of paper. Till comparatively lately the practice of cigarette-smoking was hardly known in England. Now, however, it is well established among us, and the consumption daily assumes an enormous increase in spite of the many attacks made upon the practice, sometimes on the score of effeminacy, and sometimes on account of its alleged unwholesomeness. Much of its popularity, no doubt, is owing to the favour it finds among women, who not only encourage its use in their presence, but often find in it a mode of themselves enjoying tobacco without incurring the odium which would attach to using a pipe or cigar.

Cigoli, LUIGI CARDI (1559-1613), an Italian architect, painter, and poet of the later Florentine school, who formed his style chiefly after Michael Angelo, Andrea del Sarto, and Correggio. Of his paintings an *Ecce Homo* at Florence gained a prize in competition, and was taken to the Louvre by Napoleon, but restored in 1815, and a *Martyrdom of St. Stephen* gained him the title of the Florentine Correggio. He died at Rome, whither he had been invited by the Pope.

Cilia, are minute vibratile hair-like processes, which are capable of rapid vibration backwards and forwards: they occur in most groups of animals. Their function is usually to create currents of water either for the collection of food, *e.g.* in the Rotifers and Brachiopoda, for respiration, as in the gills of Lamellibranchiate Mollusca, such as the mussel, or for the removal of excreta, as in the ciliated funnels of worms. In other cases they

may serve for locomotion as in the case of *Paramecium*, the "Slipper animalcule." Their true nature is most easily seen in the Protozoa: they result from the attenuation of pseudopodia, the protoplasmic processes put forth by many of the lower members of that phylum [AMOEBA]; when these pseudopodia lose their direct locomotive function they may acquire the habit of merely vibrating in one plane; they then become much finer, and drawn out into cilia. One of the three great divisions of the Protozoa is known as the Ciliata (or Infusoria) owing to the importance of cilia to the members of this division; it is classified into orders according to the arrangement of the cilia.

Ciliata. [INFUSORIA.]

Ciliate, from the Latin *cilium*, an eyelash, is a term meaning "fringed with hairs," applied especially to the margins of leaves.

Cilicia, an ancient province of Asia Minor, now forming part of the Turkish province of Adana, comprised a large part of the southern coast from Pamphylia on the W. to the Syrian frontier on the E., and extending from the Mediterranean on the S. to Mount Taurus on the N., forming a narrow strip of 270 miles by 68. The western or mountainous part abounded in timber, and the eastern part was fertile, giving much corn and wine. Cilicia was taken by the Persians, then by Alexander, then became Syrian. Part of it was long the centre of a great piratical state, which was put down by Pompey; by whom it was made a Roman province in 67 B.C.

Cimabue, GIOVANNI (1240-1302), an Italian painter of Florence, and the founder of the Florentine school to which Michael Angelo, Raphael, and Leonardo da Vinci belonged. He was the first to leave the stiff traditional forms, and to copy from Nature and from the living model. Of his pictures the most remarkable are two Madonnas—one in the Academy at Florence, and the other in the church of Santa Maria Novella, the latter of which is a landmark in the progress of art, and was received with great enthusiasm at the time of its production, and was carried to the church in grand procession. Cimabue executed some notable frescoes at Assisi, and he had charge of the mosaic work of the Duomo of Pisa, some of his mosaics being considered the finest of the period.

Cimarosa, DOMENICO (1749-1801), an Italian operatic composer, educated at Naples. At 22 he had a reputation in all the theatres of Italy, and resided for four years at St. Petersburg as composer to Catherine II. of Russia. After passing some time at different German courts, he became Kapellmeister at Vienna, and finally returned to Italy, and died at Venice while meditating a return to St. Petersburg. Of his works, *Il Matrimonio Segreto* (1791) is his masterpiece, and ranks very high among light operatic music.

Cimbri, the name of an ancient Teutonic race whose location is somewhat doubtful, but who are generally considered to have inhabited the northern

part of Germany, and who are mentioned by Cæsar and other writers as having been formidable enemies of the Roman power, of determined courage, and capable of intense patriotic devotion.

Cimmerians, according to Homer, a race who dwelt beyond the Ocean Stream in a land of fog and darkness, identified at a later period as a Crimean race who dwelt about the Sea of Azoff and the lower course of the Volga. Metaphorically the word Cimmerian was applied as an intensive of darkness. Milton in *L'Allegro* bids loathed Melancholy "in dark Cimmerian desert ever dwell."

Cimon, died 449 B.C., son of Miltiades (q.v.), was born at Athens. He was imprisoned, through inability to pay a fine levied upon his father, until his brother-in-law paid it and released him. The struggle between Athens and Persia was then going on, and young Cimon, in conjunction with Aristides, who had taken him under his charge, was put in command of the Athenian squadron of the allied fleet under the Spartan Admiral Pausanias. Cimon captured a Persian garrison, and in 466 he almost annihilated a Persian fleet, and on the same day gained a land victory. He also drove the Persians out of Thrace and a great part of Asia Minor. He had now great influence at Athens, and his great bounty and lavish expenditure made him very popular. Later he led an army to the aid of the Spartans during the revolt of their serfs, but it was dismissed by them through want of confidence. On his return to Athens Pericles and the democratic party attacked him, and secured his banishment. After four years of exile he was recalled, and again took part in public affairs. He was killed during the siege of Citium, in 475 B.C., by the Cypriots; the "peace of Cimon" was a treaty between Athens and Persia, which excluded Persia from the Aegean.

Cinchona. [See Cinchonine.]

Cinchonine, a white crystalline substance, and other closely related alkaloids, are obtained from the bark. Its chemical formula is $C_{19}H_{21}NO_8$. It has been the subject of much research, but is not yet established as a mono-amine. It forms prisms, melting at 150°C. Its physiological action is marked.

Cincinnati, a city of Ohio, situated on the Ohio River, which flows from the north. It is the largest city in Ohio, and its population is over 100,000. It is the seat of a series of educational institutions, and its Park is one of the largest in the country. It has 24 public libraries, and is famous for its imposing buildings, including the Ohio Statehouse, which is a masterpiece of Greek Revival architecture. The city is also known for its trade in grain, and its position on the Ohio River makes it a great center of commerce. The Erie Canal, which was completed in 1825, further enhanced its importance as a trade center.

Porkopolis, an honour, however, which is now divided with other towns. Incorporated in 1819, it had the title of "Queen of the West," and was and is a great home of culture and art.

Cincinnati, ORDER OF THE, in American history, was founded by the officers of the revolutionary army just before it was disbanded. Membership was restricted to themselves and their male descendants, and if the direct line failed collateral branches were eligible. It was denounced by several state legislatures as a military aristocracy, and discountenanced by Benjamin Franklin and other civilian leaders of the Revolution, and in 1784 Washington prevailed on the members to abolish the hereditary principle. In several states it still survives, and is recruited by co-optation, but it is safe to say that very few Americans are aware of its existence. The name is derived from L. Quinctius Cincinnatus (see below).

Cincinnatus, LUCIUS QUINCTIUS, an old Roman republican model of patriotic virtue and simple patriarchal manners. He was consul in 460 B.C., and at a crisis caused by the defeat of a consular army by the Aequi, was summoned from his plough to become Dictator. Having defeated the Aequi and saved the Roman army, he returned to his plough and little farm. Once more he was summoned at the age of 80 to take the helm of state as Dictator on the occasion of the conspiracy of Sp. Maelius.

Cinclides are the apertures through the mesenteries and walls of Sea-anemones, by which communication is established between the body cavity and the exterior, and between the various chambers between the mesenteries. [ACTINIA.]

Cineas (died 270 B.C.), a Thessalian, the friend and adviser of Pyrrhus, king of Epirus. His eloquence was so great that when sent on an embassy to Rome the Senate refused to hear him for fear of being charmed by it. Pyrrhus said that the eloquence of Cineas had won him more cities than his own arms.

Cineraria, a genus of Compositæ closely related to *Senecio*, the groundsels and ragworts. *C. cruenta*, the chief species, a native of Teneriffe, has broad, heart-shaped toothed leaves, and numerous heads with dark crimson disk-florets and a lighter ray. Seedling varieties have countless differences of colour in either disk or ray, white, purple, pink, etc. In our conservatories it keeps up a brilliant show of colour throughout much of the winter and spring.

Cinna, LUCIUS CORNELIUS, a Roman statesman belonging to the Marian faction. Sulla drove Marius out of Rome, and having himself set out to conduct the war against Mithridates, King of Pontus, he made the Consul Cinna swear not to alter the existing political state of things. The latter, however, on Sulla's departure, impeached him in 87 B.C., and with Marius took the direction of affairs after a general proscription and massacre of the chief members of the opposite party. Three years later

he went out to meet and oppose Sulla, who was returning with his army and vowing vengeance, but at Brundisium Cinna was slain by his own soldiers. His daughter Cornelia was the wife of Julius Cæsar.

Cinnabar, the crude form of vermilion, the sulphide and chief ore of mercury (HgS). It is a cochineal-red mineral, generally massive, but sometimes crystallising in the Hexagonal system, with an adamantine lustre and a scarlet streak. Its hardness = 2.5 and its specific gravity 8. It is insoluble in nitric or hydrochloric acids, but soluble in aqua regia. Before the blowpipe it volatilises entirely on charcoal, but gives sulphurous fumes and a sublimate of mercury in the open tube. It occurs in limestone and slate, at Idria in Carniola, Almaden in Spain, China, Japan, Chili, Peru, Mexico, and California. It sometimes contains drops of pure quicksilver (q.v.).

Cinnamic Acid, an organic acid of composition $C_7H_7CO_2H$, occurring in many balsams (Tolu, Peru, storax, etc.), and in some benzoin resins. It crystallises in prisms, soluble in hot water, and may be prepared artificially by many different reactions, or obtained from storax. It is used in medicine as an aromatic stimulant, and sometimes to disguise the taste of disagreeable drugs.

Cinnamon, the inner bark of a small lauraceous tree (*Cinnamomum zeylanicum*) largely grown in Ceylon. The bark is stripped off two-year-old shoots in May and November and dried in the sun, undergoing a slight fermentation. It rolls up into quills, the thinnest being the best. Cinnamon contains a fragrant essential oil and has long been valued as a spice. It has also some medicinal value as a cordial and stomachic. Britain imports about 800 tons.

Cinq-Mars, HENRI, MARQUIS DE (1620-1642), son of Maréchal, the Marquis d'Effiat, and favourite of Louis XIII. He was introduced at court by Cardinal Richelieu, and his figure and manners soon made him a great favourite and secured his advancement. But his ambition outstripped his discretion, and looking on Richelieu as the great obstacle to the carrying out of his ideas he joined with the king's brother in a plot to murder the Cardinal. For his share in this conspiracy he was executed at Lyons. De Vigny has made his story the subject of a romance.

Cinquefoil, an architectural ornament consisting of a five-leaved opening of a conventional shape. The name has also been applied to certain groups of plants, and more particularly to the genus *Potentilla* in the rose-tribe.

Cinque Ports, originally the five ports of Hastings, Romney, Hythe, Dover, and Sandwich, with, in later times, the addition of Winchelsea and Rye. These ports supplied ships of war for the king's navy, and received in return some important privileges in the way of government, constitution and other. Their representatives are entitled to bear a canopy over the sovereign at coronation, and ships hailing from a cinque port are exempt from the payment of harbour dues.

Cintra, a Portuguese town in the province of Estramadura, 17 miles N.W. of Lisbon. There is an interesting palace at Cintra, once the residence of Moorish and afterwards of Christian kings, and showing a curious mixture of architectural styles. Cork convent in the neighbourhood is so called because the cells of the monks are lined with cork to keep out the damp. In 1808 a Convention—signed here—between the French and English, allowed the former to retain their arms and baggage on condition of evacuating Portugal. For this Convention the English generals were court-martialed.

Cippus, a small low column used by the ancient Romans as a mile-post or boundary stone. The name was also applied to a hewn stone marking a burial place. These are not to be confounded with the baetyls of the Phœnicians, which were probably meteorites, and were supposed to be animated by a deity. [STANDING STONES, STONE WORSHIP.]

Cipriani, GIAMBATTISTA (1727-1785), an Italian painter and designer, was born at Florence, where he studied under an English painter. He then studied for three years at Rome, and in 1755 settled in London, where his drawings, engraved by Bartolozzi, became very popular and had much influence upon English art. In 1768 he became a foundation member of the Royal Academy, whose diploma was from his design, and he exhibited till 1779. He is also known as an etcher.

Circars, THE, a former Indian territory on the coast of the Bay of Bengal, 100 miles by 18, and having an area of 17,000 square miles. The Circars—now part of the Madras Presidency—were ceded to the French by the native authorities in 1757. Lord Clive obtained their cession by the Court of Delhi to the East India Company in 1766, and they became an ordinary British possession in 1823.

Circassia, a territory bordering on the Western Caucasus, whose inhabitants, the Circassians, have in a great measure, upon the acquisition of their territory by Russia, migrated to Turkish territory in Asia Minor, or the mountains of Bulgaria. The race has long been noticed for the sturdy spirit of independence with which they have resisted Russian aggression, and for the beauty of their women, who are the chief ornaments of the Turkish harems. The nobles are generally Mussulmans, but the mass of the people profess a kind of rudimentary Christianity.

Circassians [CHERKESS], the chief member of the Western Caucasian family [CAUCASIANS II.], whose territory formerly comprised all the land from Abkhasia north-east to the Kuban basin. *Cherkess* is the Tatar, *Adighé* the national name, meaning "Highlanders." Numerous subdivisions at one time speaking no less than 72 distinct dialects, all very harsh and uncultivated; but the six Adighé tribes proper (full-blood Circassians) are the Nachvo, Natakhvo, Kobli, Sabich, Gvoghvo, and Sotokh, these last grouped in "brotherhoods," whose members are related to each other as brothers and sisters, and therefore cannot intermarry. Prevailing type:—middle size, fair complexion, blue eyes, hair of all shades, but red most common, broad

shoulders, robust figures. All are Sunni Mussulmans. Population (1859) 500,000, reduced after their final reduction by the Russians (1864) to 300,000, all of whom emigrated to Turkey except 76,000. These have been since further decreased, and at the end of 1880 none remained in their ancient homes, except a few scattered communities along the left bank of the Kuban. The country has been mostly re-settled by Russian immigrants. The Circassian exiles are now dispersed over Asia Minor and Turkey in Europe, where they are being gradually merged in the surrounding populations.

Circe, the great sorceress of ancient Greek folklore, whom Homer describes as a "fair-haired, clever goddess possessing human speech." She had the habit of changing human beings into the shape of wolves, lions, and other beasts, a power still possessed, according to Milton, by her son Comus, and she changed Ulysses' companions in this way, but Ulysses escaped by the use of the herb Moly, and lived with her a year, getting back his companions, and having generally no cause to complain of her treatment of him. She it was who, through jealousy, changed Scylla into a monster.

Circle, a well-known curve defined by Euclid as a plane figure bounded by a line such that every point on the line is equidistant from a certain point within the figure. This point is the *centre*, the boundary is called the *circumference*, and any line from centre to circumference is called a *radius*. All chords through the centre are therefore equal to twice the radius, and are of equal length; such chords are called *diameters*, which is an axis of symmetry of the circle. Chords are equal if they lie at equal distances from the centre; the distance from the centre to a chord is as its distance from the circumference. The length of the circumference is $2\pi r$, where r is the radius of the circle, and π is the ratio of the circumference to the diameter, a constant which is approximately equal to 3.14159. The Greek letter π , which is an approximation having the best remembered exact multiple is $\frac{22}{7}$, cannot be expressed in a finite decimal. It follows that all attempts to find a square of a circle, must be fruitless, and to overstate the case, it is impossible to construct a square equal in area to a circle. The circumference of a circle is six decimal places less than the square of its radius. The curvature of a circle is the same, and is equal to the reciprocal of its radius. The circumference of a circle is the greatest of all the perimeters of figures having the same area.

The circle is obtained by the intersection of two perpendicular planes, one of which is as a sphere, and the other as a circle, the axes of the sphere being perpendicular to the plane of the circle.

by a straight line in two points only, and from any point only two tangents can be drawn to it; these two tangents are equal to each other.

The *circular measure* of an angle (q.v) is of great importance in theory. Any angle at the centre of a circle of unit radius subtends a circular arc, whose length is proportional to the angle, and is therefore a measure of it. For the squaring or quadrature of the circle, see QUADRATURE.

Circle, ARCTIC, is a circle round the north pole at the uniform angular distance of $23\frac{1}{2}^\circ$. It, therefore, is identical with the line of north latitude $66\frac{1}{2}^\circ$. It separates the Arctic from the North Temperate zone, just as in the southern hemisphere the Antarctic circle separates the Antarctic from the South Temperate zone. Inasmuch as $23\frac{1}{2}^\circ$ is the angle of obliquity of the earth's equator to the ecliptic, there are periods of the year when the sun never sets during the day, and other periods when it never rises during the day, in the Arctic and Antarctic regions.

Circle, GREAT AND SMALL. Any plane section of a sphere cuts the surface in a circle. *Great circles* are those obtained when the plane of section passes through the centre of the sphere; lines of longitude and the equator are examples of great circles on the earth. The shortest distance between two points of a sphere is along the great circle containing those points; hence, *great-circle sailing* in navigation. All other sections of a sphere form *small circles*; examples of these are seen in the Arctic and Antarctic circles, and in all other lines of latitude excepting the equator.

Circle, MERIDIAN, of an observer is the great circle on the celestial sphere through the pole, and through the zenith of the observer. The sun crosses his meridian at mid-day.

Circles, STONE. [STANDING STONES, STONEHENGE.]

Circuit, ELECTRIC. When two points are connected by an electrical conductor, between which points a definite difference of potential may be kept up, a circuit is said to be formed, and a current will be set up whose strength is proportional to the magnitude of the electromotive-force supplied, and to the conductivity of the complete circuit. If the circuit be broken, i.e. if the continuity of the conductor from the one given point to the other be disturbed by the introduction of a very high resistance, then the transfer of electricity is practically stopped. The quantity of electricity displaced per second across any section is the same for all parts of the circuit, and is a measure of the strength of the current. [COULOMB.] The energy spent per second during the flow of the current through any part of this circuit may be understood to be the energy lost by the above quantity lowering its potential. If A is the current in *amperes*, and V the potential-difference in *volts* at the two ends of the specified portion of the circuit, AV measures the energy given per second to that portion, and $AV \div 746$ gives us at once the

horse-power employed. This is a very useful expression in practical work. [ELECTRICITY.]

Circuits. These are the routes taken by the several judges of the Supreme Court in holding the assizes. Considerable alterations in them were made by the Judicature Act, 1875, and by the orders in council made pursuant to such Act on Feb. 5 and May 7, 1876, and June 26, 1884. They now are as follows:—

1. *The Northern Circuit*, comprising the counties of Westmoreland, Cumberland, and Lancaster; the Assize towns being Appleby, Carlisle, Lancaster, Manchester, and Liverpool.

2. *The North-Eastern Circuit*, comprising the counties of Northumberland, Durham, and York, and counties of the town of Newcastle-on-Tyne and city of York; the assize towns being Newcastle, Durham, Leeds, and York.

3. *The Midland Circuit*, comprising the counties of Lincoln, Nottingham, Derby, Warwick, Leicester, Northampton, Rutland, Buckingham, and Bedford, the counties of the city of Lincoln and town of Nottingham; the assize towns being Lincoln, Nottingham, Derby, Warwick, Leicester, Northampton, Oakham, Aylesbury, and Bedford.

4. *The South-Eastern Circuit*, comprising the counties of Norfolk, Suffolk, Huntingdon, Cambridge, Hertford, Essex, Kent, and Sussex, and county of the city of Norwich; the assize towns being Norwich, Bury St. Edmunds, or Ipswich, Huntingdon, Cambridge, Hertford, Chelmsford, Maidstone, and Lewes.

5. *The Oxford Circuit*, comprising the counties of Berks, Oxford, Worcester, Stafford, Salop, Hereford, Monmouth, Gloucester, and counties of the cities of Worcester and Gloucester; the assize towns being Reading, Oxford, Worcester, Stafford, Shrewsbury, Hereford, Monmouth, and Gloucester.

6. *The Western Circuit*, comprising the counties of Southampton, Wilts, Dorset, Devon, Cornwall, Somerset, and counties of the cities of Exeter and Bristol; the assize towns being Winchester, Devizes or Salisbury, Dorchester, Exeter, Bodmin, Taunton, or Wells, and Bristol.

7. *The North and South Wales Circuit*, comprising *North Wales Division*, the counties of Montgomery, Merioneth, Carnarvon, Anglesea, Denbigh, Flint, and Chester. *South Wales Division*: Counties of Glamorgan, Carmarthen, Pembroke, Cardigan, Brecknock, and Radnor, and counties of the borough of Carmarthen and town of Haverfordwest; the assize towns being Welshpool, or Newtown, Dolgelly, Carnarvon, Beaumaris, Ruthin, Mold, Chester, Cardiff, or Swansea, Carmarthen, Haverfordwest, Cardigan, Brecon, and Presteign. The places, and also, as far as may be, the days for holding assizes, are fixed, and various other regulations as to circuits made by the "Circuits Order, 1884" above referred to.

The Circuit Courts of Justiciary in Scotland are very similar in constitution to the Assizes in England in criminal matters, but in civil causes their jurisdiction is limited to the hearing of appeals from local tribunals. There are three circuits in Scotland (the north, south, and west).

Circuity of Action is where a litigant by an indirect and circuitous course of proceeding makes two or more actions necessary in order to obtain the rights of all parties interested, which by a more direct course he might have attained in a single action. For example, where a defendant in an action on contract, instead of showing a case for mitigation of damages, allows the plaintiff to recover the full amount of the contract in the first action, and then commences a cross-action to regain the amount which he might have set-off as against plaintiff's claim in first instance. Formerly, indeed, the defendant was compelled to bring a cross-action, there being no other remedy; but now evidence in mitigation of damages can be given and circuity of action thus avoided.

Circular Measure. [CIRCLE.]

Circular Notes are a kind of bank-notes personal to the bearer, and are supplied by bankers to travellers with a list of foreign bankers who may be asked and expected to cash them. They are generally accompanied by a letter of identification on which the traveller has signed his name, and foreign bankers may ask for his signature for the sake of comparing it with that appearing upon the letter, and so obtaining greater security of identity.

Circulation of the Blood. The course of the circulation in mammals (and birds) is diagrammatically represented in the accompanying figure.

Arterial blood coming from the lungs reaches the left auricle *a* by the pulmonary veins *l*; from the left auricle it is conveyed into the left ventricle *b*, and thence is forced by the ventricular contraction into the aorta. In its course from *b* to *c*, i.e. from the left ventricle to the right auricle, the blood completes the *systemic* part of the circulation. The aorta and its branches, by repeated division and subdivision, merge into the capillary network *g* of the several parts and organs of the system; and the blood of the capillaries is gradually collected again by the veins and conveyed back to the heart at *c*. From

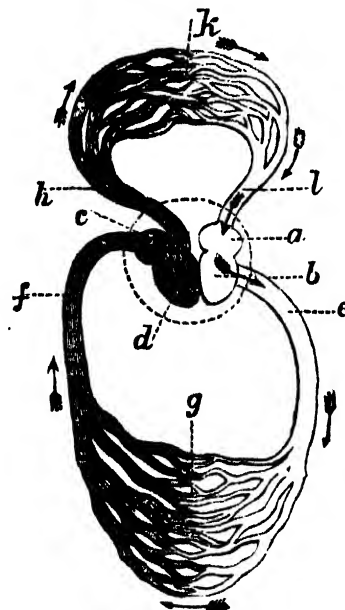


DIAGRAM SHOWING THE COURSE OF THE CIRCULATION OF THE BLOOD.

the right auricle *c* the next step is to the right ventricle *d*, and then the blood is forced into the pulmonary artery *h*, and traverses from *h* to *l*, the *pulmonary* part of the circulation. Arrived at *l*, the circle is completed. The systemic and pulmonary parts of the circulation are sometimes called the greater and the lesser circuits respectively.

The right and left auricles contract simultaneously, and so do the right and left ventricles [HEART]; so that at the same instant that the

contents of the left ventricle are discharged into the systemic vessels, the contents of the right ventricle are propelled into the pulmonary vessels. The amount of blood discharged at each ventricular contraction is in an adult about four ounces, and it has been calculated that the complete round of the circulation can be made by substances injected into the blood-stream in about two minutes. In the greater and lesser circuits, as already described, only one system of capillaries is traversed by the blood, on its way from left ventricle to right auricle, or from right ventricle to left auricle. Under certain circumstances, however, there is a double capillary system interposed in the path of the blood from the left ventricle to the right auricle. Thus, the veins of the stomach and intestines receive the contents of the capillaries and join together to form the *vena porta*, and then this great vein, instead of directly proceeding to the heart, breaks up again into a second capillary system in the liver. This peculiar portal circulation, as it is called, will be described in connection with the liver (q.v.). Again, in the kidney (q.v.), there is a double capillary system.

The facts concerning the circulation of the blood as just detailed have only been made out within quite recent times. It was supposed by the ancients that blood was carried from the heart to distant parts of the body by the veins; while the arteries, being found empty after death, were credited with conveying some kind of air or vital spirit to the tissues. Galen first showed that the arteries did actually contain blood, and he maintained—to the vitiation of the system between the right and left sides of the heart—supposed to be brought about by the septum between the ventricles. These doctrines were generally accepted for three centuries. The first to overthrow them was Servetus. This accomplished man suggested the possibility of a communication existing in the septum of the pulmonary artery and veins. It was, however, Harvey who first conceived the idea of a continuous circulation of the blood, and to him is due the credit of establishing the same by a series of logical and deductive arguments. Harvey has shown that the blood in the arteries is the same as the blood in the veins, and that it is carried to the left side of the heart by the pulmonary artery, and from the right ventricle to the lungs by the pulmonary vein, and so on, by way of the arteries, to the whole of the body, and back to the heart by the veins. The great work—published in 1628—on the circulation of the blood in animals, to show that the blood is carried to the parts of the body by the arteries, and back to the heart by the veins, is such that it is now a classic work, and is still one of the most important in the history of medicine.

of the veins. Lastly, he adduces the effect of poisons introduced at a single point upon the system generally, as an additional proof of the truth of his contentions. The advances made by science in the last twenty-five years have abundantly confirmed the truth of Harvey's ideas; in particular, the employment of the microscope has supplied the means of tracing by actual observation the course of the blood through the capillary network. Thus, to-day, the merest tyro can witness in the web of a frog's foot the marvellous race of blood corpuscles through the small arteries, their distribution into, and slower progress through, the capillaries, and their gathering together again in the venules. It is difficult for the modern student to understand how so obvious a condition of things should have remained undiscovered for so many hundreds of years, and the greatness of Harvey's discovery is well nigh overlooked in the confusion of its abundant confirmation.

Physiology of the Circulation. It is now necessary to discuss the circulation from a mechanical standpoint, and to inquire into the several conditions of pressure and of velocity of flow which obtain at different points.

The three factors which are of first importance are: the force and frequency of the heart's beat, the elasticity of the arteries, and the capillary resistance. The heart's action is intermittent; each complete cardiac cycle [HEART] occupies about $\frac{1}{10}$ of a second. With each ventricular systole a fresh amount of blood is propelled into the arteries, the capillaries offer a certain resistance to its onward flow, and hence the result of the repeated injection of fresh quantities of fluid is to bring about a condition of distension of the highly elastic coats of the large vessels. But the arterial walls being ever on the stretch, are ever tending to contract upon their contents; hence, during the period when the left ventricle is passively dilating, the arterial tension must make itself felt, and tend to drive some of the blood out of the large arteries. It cannot drive it back into the heart, the semilunar valves [HEART] excluding the possibility of a backward flow; therefore, it must drive it onward. In other words, the flow of blood through the capillary network is not affected by a series of forward movements corresponding with each emptying of the left ventricle, but takes place during the dilation as well as during the contraction of the ventricle. The flow in the capillaries is, in fact, continuous and not intermittent.

The pressure of the blood in the large vessels has been investigated by means of the mercurial manometer. An artery or vein is exposed and the flow of blood through it controlled by pressure forceps, a canula, *i.e.* a suitably-shaped tube, is then introduced (in the case of an artery, so that the pressure forceps lies between the heart and the canula opening) and connected by a leaden pipe with a U-shaped tube containing mercury. The apparatus is filled with a saline solution, so as to obviate escape of blood from the artery into the system of tubes with which it is now continuous. Moreover, the mercury in the far limb of the tube is raised by pressure to a height such as it is judged will be

necessary in order that the column of mercury supported will just about correspond with the pressure of the blood. It is clear, then, on removing the pressure forceps, and placing the blood inside the artery in direct continuity with the fluid in the canula and the leaden tube, that the variations in pressure inside the vessel will be represented by oscillations in the column of mercury. If a piston attached to a marking point be allowed to float on the free surface of the mercury, the marking point will oscillate and may be caused to record its oscillations on a revolving drum. In this manner tracings representing the alterations of level of the manometer column have been obtained, and such a tracing is called a blood-pressure curve.

It is estimated that the average pressure in the carotid artery of man is about equivalent to the weight of a column of mercury six inches high. The blood pressure rapidly diminishes on proceeding towards the periphery, and still further diminishes on passing from the capillaries to the veins. Indeed, in the large veins near the heart the pressure is very low.

The velocity of the blood, on the other hand, while it is greatest in the large arteries and decreases towards the capillaries, begins to increase again on passing from the capillaries to the veins. This, of course, arises from the fact that the velocity depends upon the calibre of the channels through which the blood is flowing. Cooped up within small dimensions in the aorta, the blood flows very rapidly (about one foot per second in man); as it approaches the capillaries, it is distributed into multitudinous channels, which, though minute individually, are collectively of much greater sectional area than the main artery from which they originate. Hence, in the capillary network, the movement of the blood may not exceed a rate of one inch per minute. When, however, the capillaries merge into veins, the gross sectional area diminishes again and the velocity increases.

It must not be imagined that the blood pressure and the rapidity of flow in a particular vessel are fixed quantities. On the contrary, in accordance with the requirements of the parts and organs of the body, modifications are effected in the local or general circulation. These modifications are brought about through the mediation of the nervous system. [VASOMOTOR NERVES.]

In certain organs local peculiarities in the circulation are recognisable. The liver and kidneys have already been alluded to, and will be fully dealt with under the articles devoted to their consideration. In erectile structures special conditions obtain, the venous sinuses permitting of great distension by increased afflux of blood. The capillaries of the lungs again present peculiarities. [LUNGS.] Lastly, the circulation in the brain differs in several respects from that in other parts of the body. [BRAIN.] The large arteries supplying the brain, passing as they do through bony canals, are incapable of becoming much distended; moreover, by their tortuous course and free anastomosis the impetus of the blood in them is modified and uniformity of blood supply ensured. Again, the large venous sinuses of the cranial cavity present unique characters.

Circumcision, the practice of cutting away the prepuce of males, and in some countries that of females also. The practice prevailed among many ancient peoples, and obtains in various parts of the world at the present day, notably among the Jews and the Mohammedans. Various reasons have been suggested for the adoption of the rite, some thinking it to have had a religious origin, some thinking it a sacrifice to malignant powers, others thinking that it was adopted in hot countries simply from motives of cleanliness. In the Christian Church the Circumcision (January 1) is the festival that commemorates the day of Christ's circumcision.

Circumference, in the ordinary sense, is the curve which encloses a circle, ellipse, or other plane figure, the word *perimeter* being generally employed if the boundary is made up of straight lines, as with the square, hexagon, or other polygon. The circumference of a circle or ellipse is longer than the perimeter of any ordinary inscribed polygon [POLYGON], and shorter than that of any circumscribed polygon. Strictly speaking, a circle is the curve itself, not the space enclosed by the curve; it is a line, not an area. The length of the circumference of a circle bears a definite ratio to the length of its diameter, this ratio being the same for all circles. It is the same ratio that the area of the circle bears to the square on its radius, or that the area of an ellipse bears to the rectangle contained by its two semi-axes. [CIRCLE.]

Circumferenter, an instrument used in surveying, for the measurement of horizontal angles by means of a magnetic needle. [SURVEYING.]

Circumnavigation, the act of sailing round. The term is generally applied to the voyage round the world as made by Anson, Cook, and others.

Circumstantial Evidence. [EVIDENCE.]

Circumvallation, a system of fortification or defence carried round any place; but the word is more usually applied to a line of defence carried round the rear of a besieging army, and having for its object the protection of such army from the possible attack of an army advancing to the relief of the besieged place.

Circus, the building appropriated in a Roman city to the holding of games, horse-racing, and wild-beast or gladiatorial shows. In racing, the line of the longitudinal axis was marked by a low barrier, round the end of which the chariots turned. The circus received a new interest in early Christian times from being the scene of many a Christian martyrdom. A circus in modern times is a round building or enclosure, generally of a temporary nature, used for the exhibition of feats of horsemanship and the like, and also to denote the exhibition that takes place therein. In architecture a circus is a kind of widening out of a street where crossed by another by cutting off the corners and arranging the buildings in a circular form. Examples are Oxford and Piccadilly Circuses.

Cirripes are the most numerous and the most important of the barnacles known in the small, shallow number of allied to the Cirripedia, which are the crustacea that all the Cirripedia are allied to. They are the Cirripedia, the

Cistercians, a monastic order founded by Abbot Robert in 1098 at Cîteaux (Cistercium) near Dijon. The order followed the rule of St. Benedict, and being exempt from episcopal control formed an ecclesiastical republic. St. Bernard of Clairvaux almost refounded the order, to which belonged the Feuillants of France and the nuns of Port Royal. The Trappists are an offshoot of it. The habit is white with black scapular, and a large white surplice with hood is used in ministrations.

Cistus, a genus of shrubs, natives of Southern Europe, North Africa and the Canaries, which gives its name to the order *Cistaceæ*. They have opposite simple lanceolate leaves and handsome rose-like but fugacious flowers which only open in sunshine. They have five sepals, five petals, indefinite stamens and a capsule imperfectly divided into five or ten chambers. This last character distinguishes the genus from our wild *Helianthemum*, or rock-rose, in which there are only three partitions. *C. creticus*, with purple petals having a yellow spot at their base, and *C. ladaniferus*, a native of Spain and Portugal, with white flowers with a purple spot, yield the balsamic oleo-resin *labdanum*, used in fumigation. Many other species of "Gum Cistus" are grown in our gardens.

Cistvaen, Cist. [BARROW.]

Citation, a proceeding to compel the appearance of a party in court to answer a claim. It is more particularly applicable to the Probate and Divorce Division of the High Court of Justice, where the party to be affected by the order of the Court is served with a citation issuing from the High Court of Justice, the object of which is to compel a representation to be taken by those who are primarily entitled to it, or to provide a substitute upon a voluntary renunciation on their part. In the Ecclesiastical Courts generally the issue of a citation is the usual mode of commencing a suit. It is the judicial act by which a defendant is commanded to appear in the suit.

Citizen. Aristotle defines a citizen as one who participates in the executive, judicial, and legislative power in a state, but he observes that his definition strictly applies only to a democratical form of government. The Roman word *civis* in its original and proper sense also meant one who had some share in the sovereign power of the State, though it was occasionally applied in a broader sense to subjects of the Roman State. The word citizen, then, in its historical sense, cannot apply to those who are the subjects of a despotic monarch, nor to those persons under any form of government who have no share of political power. Continental publicists frequently distinguish "active citizens," who have some share of political power, from "passive citizens" (non-voters, including women and children), who have no political rights. Citizenship is usually acquired by birth, by being born of citizens. [NATURALISATION.] In most of the old Greek states, and in those states of antiquity where citizenship existed, this was the only mode in which, as a general rule, it could be acquired.

Citric Acid, a tribasic acid of the composition $C_6H_8O_7$, which occurs largely in the juice of many fruits, as lemons, gooseberries, currants, etc. It is chiefly obtained from lemon or lime juice, in which it occurs to about 8 per cent., by addition of chalk, and treatment of the *calcium citrate* so obtained with the required quantity of sulphuric acid. It forms rhombic crystals easily soluble in water, and possesses a very sour taste. Its salts are termed *citrates*, and some are employed medicinally, as citrate of iron, citrate of iron and quinine, both well-known tonics. Citrate of magnesia

consists chiefly of a mixture of tartaric acid, citric acid, and bicarbonate of soda, and contains but little magnesia. The acid and its salts are also used for photographic purposes.

Citron (*Citrus medica*), an erect glabrous tree with spinous branches when wild, native to India, but cultivated in various forms in prehistoric times. Its young shoots and the outer surface of its petals are tinged with red, and the fruit is longer than it is wide, ends in a nipple-like point, has a rough, light yellow and often thick skin, and generally an acid juice. Sir D. Brandis and Sir J. Hooker distinguish four varieties, the citron, lemon, lime and sweet lime, the last being said to be wild in the Nilgherries, whilst the citron and the lime are identified with old Sanscrit names. The Jews probably brought the citron from Babylon, and they still carry its fruit at the Feast of Tabernacles. Theophrastus and Dioscorides (q.v.) speak of it as the apple of Media and of Persia, whence it gets its specific name; but it does not seem to have been cultivated in Italy till the third or fourth century of our era. The Arabs extended its cultivation, and it is now also grown in China, Japan, and Jamaica. The fruit is oval or nearly spherical, and is sometimes six inches long.

City, a word used in England generally to designate a town which is or has been the seat of a bishopric. Sometimes, and especially in America, the word denotes any large or important town, e.g. New York City. It is also sometimes used generically as opposed to country. The City of London is that part of the English metropolis which is under the sway of the Lord Mayor. It extends from the site of Temple Bar in the west to the Tower in the east, and as far as Finsbury on the north.

City of Refuge, any one of six cities in ancient Palestine, which were set apart as sanctuaries for those who had unwittingly committed manslaughter. Three on the east of the Jordan—Bezer, Golan, and Ramoth—were established by Moses, and three on the West—Hebron, Kadesh, and Shechem—were set apart by Joshua. Medina became a city of refuge to Mahomet.

Ciudad Real, or ROYAL CITY, a Spanish town in the province of the same name, 105 miles from Madrid, and on a plain near the Guadiana. It has a small trade and some woollen and linen manufactures, and contains a fine Gothic church, and a good gateway in the ruins of the old town walls.

Ciudad Rodrigo, a Spanish town on a hill above the Agueda, 56 miles from Salamanca, and 17 from the Portuguese frontier. It was taken by the English and French in the war of the Spanish succession, and surrendered in 1810, after a gallant defence, to General Massena. In 1812 Wellington took it by storm after a siege of eleven days, and for this deed was made an Earl in England, and by the Spanish, Duke of Ciudad Rodrigo.

Civet, Civet-Cat, any species of Viverra, the type-genus of the *Æluroid* family Viverridæ, from the warmer regions of the Old World, containing forms closely allied to the True Cats and to the

A detailed black and white illustration of a leopard standing in a natural, grassy environment. The leopard is shown in profile, facing right, with its head turned slightly towards the viewer. It has a dark coat with prominent light-colored stripes. The background consists of tall grass and some low-lying shrubs, rendered with fine lines and cross-hatching for texture. The overall style is that of a classic natural history illustration.

CIVET-CAT.

Civil Death. [DEATH.]

The Roman Laws constitutions of their twelve tables of the or Statutes enacted edicts of the Prætor or opinions of learned the imperial decrees, emperors—had grown were computed to be who preceded Justinian the collection Hermogenian Theodosius was compiled of all the Theodosian received till many that the some recent newly created of the Emperor Civil Law and other

The legal system of the laws made the law upon five that they author decreed by Gratianus, Bonaforriode constitutiones which civil law of Europe payable monthly pay as for their necessities in body of Theodosian

Civil List, an annual sum granted by Parliament at the commencement of each reign for the expense of the Royal Household and Establishment, as distinguished from the general exigencies of the State, it being the provision made for the Crown out of the taxes in lieu of the Crown's proper patrimony, and in consideration of the assignment of that patrimony to the public use. This arrangement has obtained from the time of the Revolution downwards, though the amount fixed for the Civil List has been subject in different reigns to great variation. At the commencement of the present reign, by the "Civil List Act" a Civil List was settled on His Majesty for life to the amount of £470,000 per annum, payable quarterly out of the Consolidated Fund. Of this, the sum of £110,000 is assigned for His Majesty's private purse, the remainder being applicable to the salaries and expenses of his household. By the above-named "Civil List Act" the King is also empowered to grant pensions to the amount of £1,200 per annum, chargeable on his Civil List revenues, as a provision for those who have just claims on the Royal beneficence, or by their services or discoveries have merited the gratitude of their country.

Civil Service. One of the three great branches of the public service of the State, the others being the Army and the Navy. It includes the executive departments of the Treasury, Home Office, Foreign Office, Colonial Office, Local Government Board, Board of Trade, etc., the great revenue departments of the Customs, Inland Revenue, and Post Office, the administration of Law and Justice, Education, Science and Art, and the Diplomatic and Consular services. The expenditure of each Civil Department is estimated yearly, and voted by Parliament as the Civil Service Estimates. An account of the actual disbursements, audited by the Exchequer and Audit Department, is embodied in the Appropriation Account for the year, and presented with the Comptroller and Auditor-General's

Report thereon, to the Public Accounts Committee of the House of Commons. The net total of the Civil Service Estimates for the financial year 1908-9 was £30,496,947, divided into classes, the principal of which are Public Works and Buildings, Salaries and Expenses, Law and Justice, Education, Science and Art. This sum does not include the expenditure on the Customs, Inland Revenue and Post Office, which are primarily Revenue Departments, and which are estimated for separately from the spending Departments.

Prior to 1855, appointments to the Civil Service were made by patronage. From 1855 to 1870 nomination was required, but candidates were also obliged to pass a qualifying examination applied by the Civil Service Commissioners, an independent body created for this purpose. In 1870 the system of open competition was established and introduced into the majority of public departments, and, in accordance with this principle, various schemes of examination and pay have been in operation. The first, in 1870, was the division of clerical appointments into Classes I. and II., partially superseded in 1876 by the Playfair scheme, which was itself afterwards abolished by successive Orders in Council. The clerical establishments are now divided into two classes, the Upper or First Division, and the Second Division. Examinations for appointments to the Upper Division, after being suspended for five years, were resumed in November, 1891, and are being continued at regular intervals, though vacancies occurring in the higher establishments of some departments are being filled by clerks of the Second Division. The examination is of a high educational character; the limits of age for competitors are 22 and 24; the commencing salaries vary in the different departments from £100 to £200, with promotion to higher appointments carrying maximum salaries reaching to £1,000. The examination for Second Division clerkships was, till recently, of a comparatively simple educational character, though the keen competition for these appointments rendered a high standard of proficiency in all the subjects of examination necessary for success. From the 30th of June, 1900, a new scheme of examination has been in force, in which subjects of a higher educational character have been introduced. The limits of age are 17 and 20; the commencing salary is now uniformly £70, rising by annual increments to £350, with exceptional promotion to the Upper Division. The hours of attendance for both classes are seven, usually from 10 to 5. Competitive examinations are also held for appointments as assistant examiners in the Patent Office, assistant surveyors of taxes, assistants of Excise, assistants of Customs, assistant clerks (abstractor class), male sorters in the Post Office, temporary boy copyists, temporary boy messengers, as well as for many appointments for which previous professional or technical training is required. Printed regulations for the foregoing as well as for most other examinations are obtainable from the Secretary, Civil Service Commission, London, S.W. Females, selected by open competition, are employed in the Post Office as women clerks, girl clerks, sorters, and telegraphists. Female telegraph learners and sorters

commence respectively at ten and twelve shillings per week; women clerks at £65 per annum. The female staff at the General Post Office, London, is steadily increasing, but no other department as yet admits female clerks. Female typists are employed in some departments, but an official nomination is required for this situation. By a decision of the Postmaster-General in November, 1891, vacancies among the rural and provincial town postmen, and among the auxiliary postmen in London, are in future to be offered in the first place to Army Reserve men and discharged soldiers.

Appointments abroad, open to competition, include the India Civil Service, India Forest Service, Student Interpreterships in China, Turkey, etc., and Eastern Cadetships. The principal appointments for which nomination is still required, followed by limited competition, are British Museum assistants, clerks in the Foreign Office, House of Commons and House of Lords, and cadets in the Royal Irish Constabulary. Civil Service Examinations are announced by advertisement in some of the principal newspapers; they are held in London, and, for some classes of appointments, in Edinburgh, Dublin, Liverpool, Leeds, Bristol, etc., as well. After passing an examination, certificates of age, health, and character are in all cases required. All permanent Civil Servants are entitled to pensions, which are governed chiefly by the Superannuation Acts of 1859 and 1887, and the Pensions Commutation Act of 1871. After ten years' service a pension of ten-sixtieths of the annual salary is granted, and for each additional year an additional sixtieth, with the limit of a total of forty-sixtieths.

Civita Vecchia, a fortified port on the W. coast of Italy, giving its name to a province of which it is the chief town. Situated 40 miles N.W. of Rome, it affords almost the only safe anchorage on the coast. Wheat, alum, cheese, skins, staves, and bark, are the staple exports, whilst the imports consist of woven fabrics, salt and salted provisions, wine, and drugs. The town originally sprang up round a palace of Trajan, and it grew to some commercial importance. It was totally destroyed by the Saracens (812), and rebuilt under Pope Leo IV. The province has an area of 380 square miles.

Clackmannanshire, the smallest county in Scotland, comprising only 29,440 acres, is bounded S. by the river Forth and part of Perthshire, N. and E. by Perthshire and Fifeshire, and W. by Stirlingshire. It is drained by the rivers N. and S. Devon, and the soil is mostly alluvial and flat, producing heavy crops of peas, beans, corn, etc. The Ochil Hills, rising to over 2,000 feet in the N., and an elevated ridge traversing the centre, are only suited to pasturing sheep. The county is rich in minerals. Coal, iron-stone, hæmatite, copper, silver, lead, cobalt, and arsenic, are worked with profit, and sandstones and basaltic rocks are quarried. Manufactures are considerable, including woollens, ship-building, glass, tanning, brewing, and distilling. The chief towns are Clackmannan, Alloa, Tillin-coultry, and Dollar. Jointly with Kinross the county sends one member to Parliament. Clackmannan is the county town, but Alloa is much

the most important centre. Population (1901), 32,029.

Cladocera, a subdivision of the PHYLLOPODA, which is itself one of the four groups included in the ENTOMOSTRACA. The Phyllopoda include those elongated, segmented Entomostraca, which have a shield-shaped or bivalve shell. The Cladocera includes those Phyllopods which are small and laterally compressed and have a bivalve shell and a pair of large, two-branched swimming feet. The most typical and best-known genus is *Daphnia*, the "water flea."

Cladode, a branch flattened in a leaf-like manner, as in *Opuntia* and some other cacti, and in the butcher-broom and its congeners (*Ruscus*).

Claim, Claimant. In administration proceedings, windings-up, and similar practice in the Chancery Division of the High Court, persons who consider themselves to have rights against the assets in course of administration must send in their claims in the shape of formal notice to the executor, liquidator, etc. In bankruptcy, a creditor must prove his debt before he can receive a dividend from the estate, but where he is unable to perfect his proof he is allowed to enter his claim *pro tanto*, and the dividends thereon will be reserved for a reasonable time to enable proof of debt to be made.

Clairaut, or CLAIRAULT, ALEXIS CLAUDE, the son of a mathematical teacher, was born in Paris in 1713, and developed so precocious a capacity for figures that at the age of 18 he was elected to the Academy of Science. In 1736 he was sent with Maupertuis to Lapland, to measure an arc of the meridian. He proposed a solution of the problem of the three bodies, which brought him into unhappy relations with Bernoulli and divided mathematical opinion. He calculated the perihelion of Uranus, and won the prize of the St. Petersburg Academy for his *treatise on the Lunar Motion*. He also wrote *On the Shape of the Earth* and *The Elements of Algebra*.

Clairvaux (Clairvaux), a town in the department of Aube, France, and one of the so-called "cities of the mother estate." Bernard was the first to settle there. There have been of late years many attempts at reformation.

Clairvoyance, the power of seeing things which are hidden from the eyes, or of seeing under the surface of things, or of seeing the future, and of which the French say *clairvoyant*. The clairvoyants are said to have inner consciousness, and to be able to read the intentions of others. But the clairvoyants are very few, and little, it is said, to be trusted.

Clairvoyant, a person who is said to have the power of seeing things which are hidden from the eyes, or of seeing under the surface of things, or of seeing the future, and of which the French say *clairvoyant*.

in Ireland, and indeed in almost all known races at an early period of their history. The clan in theory consisted of blood relations, descended from one common founder, and acknowledging one chief, who owed the clan countenance and protection in return for fealty. The devotion of clansmen to their chief and to each other was proverbial. Scott has well pictured the working of the clan principle in *Waverley*, *Rob Roy*, and other of his novels. The lands of the clan were in some measure held in common, and doubtless much of the agrarian troubles and confusions in Ireland have arisen from the conflict between the ideas of land-holding as introduced from England and those which prevailed under the old clan system.

Clapham, the name of several parishes and villages in the United Kingdom, the most important being the large parish (1,137 acres) that forms the S.W. suburb of London, and is situated in the county of Surrey, at a distance of 4 miles from St. Paul's. Around a breezy common there sprang up here in the 18th century a few solid and comfortable country houses, inhabited by well-to-do middle-class families. Under the influence of the Rev. H. Venn, who became vicar in 1759, and of his son John, who succeeded him, there grew up a vigorous evangelical colony that numbered among its members Wilberforce, Zachary Macaulay, W. Romaine, with other thoughtful and earnest men. Sidney Smith ridiculed them as *The Clapham Sect*, but their influence was far from contemptible. The neighbourhood has now become overcrowded with smaller tenements, and Clapham Junction has developed into one of the largest railway centres in the kingdom. Clapham and Battersea are a parliamentary borough. Pop. (1901), 51,353.

Clapperton, HUGH, the son of a surgeon at Annan, N.B., was born in 1788. Whilst serving as an apprentice on board a trading vessel he was impressed for the royal navy, in which he became a lieutenant, and had command of a vessel on the Canadian Lakes. He came home in 1817, and became associated with Dr. Oudney and Colonel Denham in an expedition sent out by Government to explore N. Africa. Clapperton got as far as Sakatu on the way to the Niger (1824), but the death of Oudney caused him to return. In the following year he was again sent out with Lander and others, penetrating into the interior from the Bight of Benin. He failed to get beyond Sakatu, where he died of dysentery in 1827. His *Journals* were published by Lander, who also wrote *The Records of Clapperton's Last Expedition*.

Clare, a county in S.W. Ireland, comprised within the province of Munster, and bounded N.W. by the Atlantic, S. by the Shannon and Limerick, E. by Tipperary, and N. by Galway. The area is 1,293 square miles. Much of the surface is rugged and mountainous, with rocks in the N. and bogs in the W., but along the courses of the Fergus and Shannon are strips (corcasses) of the richest alluvial soil. The coast is deeply indented, and generally rocky and precipitous. Liscannor Bay is the only

safe anchorage on the Atlantic, but the estuary of the Shannon, with its many recesses, affords great facilities for navigation. Kilrush, a port at the base of the long promontory of Loop Head, intercepts much of the trade of Limerick. The river Fergus traverses the county, and at the head of the deep bay that forms its mouth in the estuary of the Shannon stands the town of Clare, but Ennis, a little higher up the river, is the capital. Kilrush, Killaloe, and Kilkee are the only other places of importance. Grazing is more profitable than tillage, and but a small proportion of the acreage is under cultivation, the people depending much on potatoes for their food. Fishing is carried on with some success as far as the heavy Atlantic seas permit, and the Shannon supplies plenty of salmon. The soil is rich in minerals such as lead, iron, and manganese, but these are little worked. Coal, flagstones, slate, and marble are also valuable products. The only manufactures are flannels, friezes, and coarse cotton goods. The primitive name of the district was Thomond; the present appellation is derived from Thomas de Clare, a settler in the reign of Henry III. Clare sends two members to Parliament. Population (1901), 112,334.

Clare, EARL OF. [FITZGIBBON, JOHN.]

Clare, JOHN, the son of a farm labourer, was born at Helpstone, near Peterborough, in 1793. Whilst engaged in the humblest rural tasks he contrived to get a little education, but his erratic habits drove him before he was 18 to seek parish relief. In 1818 *A Sonnet to the Setting Sun* attracted the attention of a Stamford bookseller, and led to the publication in 1820 of his *Poems Descriptive of Rural Life and Scenery*, followed in the next year by his *Village Minstrel and Other Poems*. He was much patronised by local admirers, and seems to have been upset by his success, which was not, however, so great as to put him above the necessity of labour. *The Shepherd's Calendar*, which came out in 1827, fell flat, and *The Rural Muse*, appearing nine years later, proved a failure. Disappointment unhinged his mind, and for nearly five-and-twenty years he was more or less under restraint, dying in 1864 in the Northampton County Asylum, where he wrote his most touching lines beginning "I am! yet what I am who cares to know?" His works are almost forgotten, for though sweet, delicate, and pure, they lack vigour and originality.

Clare, CLAIRE or CLARA, ST., the founder of the order that bears her name, was born in 1193 at Assisi of a noble family. She ran away from home at the age of 18, and placed herself under the direction of St. Francis. In 1212 she established an order of Minorettes, who conformed in dress and life to the rule of the Franciscans. She died in 1253, and was canonised two years later by Pope Alexander VI. The "Poor Clares" were introduced into England by Blanche of Navarre, and, establishing themselves in Aldgate, gave their name to the Minories.

Claremont, a royal residence, situated in a picturesque park near Esher, Surrey, 14½ miles

S.W. of London, on the South-Western Railway. In the reign of Anne the estate was acquired by Sir John Vanbrugh, but in 1768 it passed into the hands of Lord Clive, who built the existing mansion. In 1816 the Crown bought the property for Princess Charlotte and her husband, Prince Leopold, and she died there next year. It was lent to Louis Philippe on his expulsion from France, and was the scene of his death in 1850. Queen Amélie and her family continued to reside there until her decease in 1866. Queen Victoria purchased it from the Crown as her private property in 1882, to make a home for the Duke of Albany, whose widow is still in occupation.

Clarence and Avondale, DUKE OF, PRINCE ALBERT VICTOR, the eldest son of Edward VII. (when Prince of Wales), and grandson of Queen Victoria, was born in 1864. Educated at Cambridge, he visited India in 1889, but died in 1892, a few months after his betrothal. the succession passing to his brother George.

Clarendon, a name used to denote a kind of thickened type, blacker than ordinary roman type.

Clarendon, EDWARD HYDE, FIRST EARL OF, was born in 1609. He went to Magdalen College, Oxford, to prepare for the Church, but the death of his two elder brothers left him heir to the paternal estates, so he took to the law, entering at the Middle Temple. He lived in the best literary society of the day, counting among his friends Ben Jonson, Carew, Waller, Selden, Chillingworth, Hales, Falkland, and Laud. In 1640 he was returned to Parliament, and joined the popular party. In the Long Parliament he began as a reformer, but when episcopacy was threatened went over to the king, and in 1643 was made Chancellor of the Exchequer. After Naseby he was sent abroad in charge of the Prince of Wales, but he only accompanied him as far as Jersey, where he lived two years, and laid the foundation of his *History of the Rebellion*. He joined Charles at Dunkirk in 1648. He was despatched next year on a fruitless mission to Spain, and passed two years in that country, composing his *Animadversions on the Supremacy of the Pope*. Rejoining the Prince in 1651, for nine years he had a difficult task to play in providing for the needs of the court, and in steering his course between Presbyterians and Papists, to both of whom he was obnoxious. In 1658 he received the titular dignity of Lord Chancellor, which he retained after the Restoration, when his chief function was to restrain the intemperate desire of Cavaliers to extinguish Roundheads, and of Episcopalians to annihilate Dissenters. The Corporation Act and the Act of Uniformity brought upon him the hatred of the Presbyterians, whilst the Acts of Indemnity and Oblivion made him even more detested by the disappointed Royalists. The sale of Dunkirk and the marriage of the king with Catherine of Braganza filled up the measure of his unpopularity. He was suspected, too, of sharing in the bribes which Charles freely accepted from France, and there was an idea that by the union of his daughter with the Duke of York he hoped to place his descendants in

the line of succession. He had rapidly been promoted to the Barony of Hyde and the Earldom of Clarendon, though the king was getting weary of his respectability, and owed him a bitter grudge for the supposed frustration of his plan for divorcing the queen and marrying Fanny Stewart. In 1667 he was summoned to surrender the Great Seal, and a few months later was impeached for high treason in the Commons. Though the Lords refused to listen to the charge, he saw that he was in a hopeless case, and fled to France. There he was threatened with expulsion, but ultimately received permission to remain, fixing his abode partly at Rouen, partly at Montpellier, and dying at the former place in 1674. His last years were spent in completing his *History* and his *Meditations on the Psalms*, and in writing his *Life*, his *Essays*, his *Survey of Hobbe's Leviathan*, and his *Short View of the State of Ireland*. Clarendon's character has been the subject of much discussion, but on the whole it must be concluded that, like Bacon, he combined high intellectual and moral gifts with incredible meanness and duplicity. Amidst all the temptations of Charles II.'s court at home and abroad he lived purely and decently. His piety was genuine, and his devotion to the Church of England and to what he conceived to be the English Constitution was unswerving. If he cherished personal ambitions, he frequently sacrificed them to public aims. He wrote masterly papers, spoke readily in debate, and was painstaking in business, but his temper was not always under control, and he lacked sympathy. Proud and cold in his relations with most men, he was abject to servility in his dealings with the king, and his conduct as regards his daughter both before and after her marriage was by his own showing inconsistent with any sense of honour. His literary style, though elegant, is seldom obscure, and, while it lacks dignity, almost invariably displays a certain amount of beauty. As a historian, his facts are in the main accurate, and his descriptions of the external character of his subjects are peculiarly happy. His style, however, prevents his penetrating into the inner life of his subjects, and he steps beyond political boundaries into the domain of literature, where he writes in a rapid and common-place manner.

Clarendon, *THE EARL OF*
WILLIAM FREDERICK
CLARENDON OF CLARENDON
 OF HINDON. He was born in 1800, and died in 1838. He was the age of the public service he was in the Whig, and formed in 1811, and of the opposition and in 1838 Russell as a year he was and found

famine. His successful efforts to relieve distress, and the policy with which he administered the Encumbered Estates Act made him very popular. Then followed the Young Ireland movement, which he suppressed mercifully but vigorously, without encouraging, however, the zeal of Orange fanatics. He left Ireland in 1852 far more settled and prosperous than he had found it, but his reward was ingratitude and suspicion. In 1853 he weakly allowed himself to be drawn into the Coalition, and, being Foreign Secretary under so feeble a leader as Lord Aberdeen, "drifted into the war with Russia." Though compelled to resign with his colleagues in 1855, he was recalled by Palmerston to the Foreign Office, and represented Great Britain at the Congress of Paris, where he procured the neutralisation of the Black Sea, the cession of Bessarabia, the recognition of Italy as one of the Powers, and the modification of the law of nations as regards blockades, privateers, and the right of capturing cargoes. When the Whig ministry was reconstructed in 1859 Lord John Russell claimed the direction of foreign affairs, and Lord Clarendon remained out of office until, in 1864, he rejoined Palmerston's cabinet as Chancellor of the Duchy of Lancaster. Next year, on the death of Palmerston, he went back to the Foreign Office, where he remained after Mr. Gladstone's accession to power. The negotiation of the Alabama claims was conducted by him, and he was endeavouring to avert the impending European war when he died in harness in 1870. His loss was universally lamented, for no statesman ever earned a higher reputation for unselfish generosity, persevering industry, single-minded pursuit of the public good, and graceful, yet dignified manners.

Claret, the word used in England to denote French red wines from the Bordeaux district. In France *clairnet* denotes a thin light wine, and this is the idea that claret conveys to nine out of ten English people. Claret was a favourite wine in Scotland during the 17th and 18th centuries, and in England too, but it was superseded by Spanish and Portuguese wines early in the nineteenth century, though it is now in favour again.

Clarification, the term given to the process by means of which a turbid solution is rendered clear. The simplest mode of clarifying is by filtering the liquid through canvas, etc., or through sand or gravel. In many cases where fine organic matter in suspension is present, the liquid is filtered through animal charcoal, or boiled with this substance, and then filtered, as in sugar refining. Centrifugal machines, depending on the fact that if a liquid be rapidly rotated the suspended matter flies to the side of the vessel, are also sometimes employed. Mordants (q.v.), as alum, may also be used as clarifiers, which, on precipitation, carry down with them the suspended matter.

Clarinet, or CLARIONET, a musical instrument usually made of wood, consisting of a mouthpiece containing a single reed by which the sound is produced. It has a compass of nearly four octaves, and its full, rich, mellow tone renders it admirably

adapted for combination with stringed instruments. Beethoven, Schubert, Mozart, and most of the other great composers have employed the clarinet with much effect in concerted pieces.



CLARINET.

Clark, SIR JAMES, born at Cullen, in Banffshire, in 1788, took the degree of M.D. at Edinburgh, and served for six years as a surgeon in the army. He then spent some time in travel, studying the effect of climates and mineral waters, and finally settling in Rome. In 1824 he was fortunate enough to be appointed physician to Prince, afterwards King, Leopold, and soon afterwards began practice in London. The Duchess of Kent took him up, and he became medical adviser to the young queen, who always regarded him with the warmest esteem, and conferred on him a baronetcy. He was elected F.R.S., and Member of the Senate of the University of London, receiving many other distinctions. He died in 1870. He wrote one or two books on climate and on the treatment of consumption.

Clark, THOMAS, was born at Ayr in 1801, and at the age of fifteen entered the counting-house of Macintosh and Co., the makers of waterproof goods. He had, however, a taste for chemistry, and after working for some years at Tennant's chemical factory, was appointed lecturer at the Glasgow Mechanics' Institute. His discovery of pyrophosphate of soda was an event of considerable scientific importance. In 1831 he took the degree of M.D., and for some time devoted himself to pharmacy. He published in the *Westminster Review* a careful inquiry into our system of weights and measures, and in 1833 was made professor of chemistry in the Marischal College, Aberdeen. Various subjects engaged his attention, but the most important of his labours resulted in the process for softening hard water, which is still in use. His health did not permit him to lecture after 1844, and he devoted his later years to the revision of the text of the Greek Testament, but his notes were never published. He died in 1867.

Clark, WILLIAM GEORGE, M.A., born in 1821, and educated at Shrewsbury school and Cambridge, became fellow and tutor, and vice-master of Trinity College, and public orator of the University. In conjunction with Mr. Aldis Wright, he brought out the Cambridge and Globe editions of Shakespeare, and was editor of the *Cambridge Essays* and the *Journal of Philology*. He took advantage of the Act of 1870 to renounce his orders in the English Church. At his death, in 1878, he left £300 a year to endow a lectureship of English Literature, a subject to which he had devoted his energies for many years.

Clark, WILLIAM TIERNEY, born at Sion House, Bristol, Somerset, in 1783, became a pupil of the elder Rennie, and in 1811 was appointed engineer to the West Middlesex Waterworks, a post which he held for over forty years. He won a name for the carrying

out of iron constructions, having built the suspension bridges at Hammersmith, Shoreham, Marlow, and Bath. His greatest work was the great bridge over the Danube, connecting Pesth and Buda, and completed in 1850. He died in 1852.

Clarke, ADAM, LL.D., was born at Moybeg, in Ireland, about 1762, and, after a meagre education, was apprenticed to a linendraper. This life became distasteful to him, and by Wesley's influence he was admitted to his school at Kingswood, where he was trained for the ministry. He earned a high reputation as a preacher, and was thrice elected president of the Wesleyan conference. The great work of his life was his *Commentary on the Holy Scriptures* (1810 to 1826), a book on which he expended much labour and intelligence, having acquired several Oriental languages by way of preparation. He also wrote *Memoirs of the Wesley Family*, a *Bibliographical Dictionary*, the *Succession of Sacred Literature*, and many other volumes. He died of cholera in 1832.

Clarke, EDWARD DANIEL, LL.D., the son of a well-known traveller and clergyman, was born in 1769, and educated at Jesus College, Cambridge. He spent his early life, after graduating, in travelling abroad with Lord Berwick and other young men of family, and he thus visited the whole of Europe (including Russia and Turkey), Palestine and Egypt. Happening to be on the spot at the capitulation of Alexandria, he obtained for the English Government all the antiquarian spoils of the French *savants*, and this brought him into notice. He also collected manuscripts and objects of interest on his own account. Returning to Cambridge, he presented to the University among other treasures the colossal statue of Eleusinian Demeter that adorns the library. He got a college living, and in 1808 was appointed to the new chair of mineralogy, a science in which he laboured assiduously. His *Travels* brought him in a very large sum, and his MSS. were sold to the Bodleian Library for £1,000. His health broke down suddenly, and he died in 1822.

Clarke, HENRI JACQUES GUILLAUME, DUC DE FELTRE and COUNT D'HUNEBOURG, was born at Landrecies in 1765, his family being of Irish origin. At the outbreak of the French Revolution he was a lieutenant-colonel in the army, but in 1793 was suspended on account of his noble birth. Carnot recalled him to the War Office, and he was employed in various foreign missions. In 1796 he was sent as a sort of spy over Bonaparte's movements in Italy, but became a firm friend of the future emperor. This led to the loss of his official rank, but he came back with Bonaparte on the eighteenth Brumaire and acted as his military secretary. He fought at Ulm and Jena, and in 1807 succeeded Berthier as minister of war, remaining in office till 1814, and receiving both his titles as a reward for his services. After the fall of Napoleon he went over to the Bourbons, and again returned to the War Office, being created a marshal. He died in 1818.

Clarke, MARY COWDEN, the daughter of Vincent Novello, the composer, was born in London in 1809. At the age of 19 she married Mr. Charles Cowden Clarke, a publisher and a man of culture, who had enjoyed the friendship of Keats, Lamb, Hazlitt, and Leigh Hunt, and had devoted much attention to Elizabethan literature. In conjunction with her husband, who died in 1877, Mrs. Cowden Clarke edited and annotated *Cassell's Illustrated Shakespeare*, and, amongst other volumes of lighter interest, wrote *The Girlhood of Shakespeare's Heroines*. But the great task of her life was her *Complete Concordance to Shakespeare*, a laborious undertaking, the first edition of which appeared in 1845. She died in 1898.

Clarke, SAMUEL, D.D., the son of a Norwich alderman, was born in 1675, and took his degree at Cambridge in 1691. He then became chaplain to the Bishop of Norwich (Moore), and obtained the living of Drayton. He rushed eagerly into the metaphysical and ethical controversies that passed for religion in the eighteenth century. His Boyle lectures, *A Demonstration of the Being and Attributes of God*, and *The Evidences of Natural and Revealed Religion*, brought him into correspondence with Butler. In 1706 he was given the rectory of St. Benet's, London, and appointed chaplain-in-ordinary to Queen Anne, from whom he presently received the living of St. James's, Westminster. He published in 1712 his *Scripture Doctrine of the Trinity*, a work of Arian tendencies. He engaged in a dispute with Leibnitz as to the principles of religious belief, and he attacked Collins for his denial of the freedom of the will. His last undertaking was a translation of the *Iliad* into Latin. He died in 1729.

Clarke, Rev. W. was born at East Bergholt, Suffolk, England, in 1812. He was educated at Dedham grammar school, and at Cambridge, where he took orders in 1835. He was a geologist, made numerous geological surveys, and was sent for his health to New York in 1842. He resumed clerical work in 1844, and made geological surveys in the West. He was a Unitarian and probably a Unitarian, though his claim to Unitarianism is disputed. In early life he wrote of poems, and he published several geological papers. He died in 1876, and was buried in the geological Society.

Clarke's hardness of adding a large quantity of plaster is for is an indication is stated a weight of 100 lbs. of plaster is required for each square yard of surface. The cost of the plaster is \$1.00 per cubic yard, and the cost of the labor is \$1.00 per square yard. The total cost of the plaster is \$2.00 per square yard.

Charles
headmaster
Cambridge

educated for the Church at St. Paul's School, London, and St. John's College, Cambridge. However, in writing a Latin prize essay (1784) on the lawfulness or otherwise of slavery, he became so engrossed in the subject that he resolved to devote his life to the work of liberation. He associated himself with Granville Sharpe and other members of the Society of Friends who had already taken up the question, and in 1787 formed a committee for the abolition of the slave trade. He spent some time in visiting various ports, and collecting information as to the traffic in flesh and blood, and enlisted Mr. Wilberforce, the member for Yorkshire, in the cause. The latter, with Pitt's sanction, brought the matter before Parliament (1789), but only after many delays and defeats was the Abolition Bill carried in 1807. Clarkson then assisted to form the African Institution to promote civilisation in Africa, and he entered upon another long struggle, which was terminated in 1833 by the Act to abolish British colonial slavery. In 1838 he received the freedom of the City of London, and in 1840 attended the anti-slavery convention at Exeter Hall. His last years were spent at his estate, Playford Hall, Suffolk, where he died in 1846.

Classics, a word derived from the Roman census-taking, and denoting things of the first class or rank. It is generally used in literature to denote either writings of a certain date in the development of a language when its literature was at its best, or to denote the writings of certain recognised writers which come up to a certain understood degree of excellence.

Classification of Plants is necessary owing to the enormous number of known forms or species and the impossibility of otherwise bearing their characters in mind, arranging collections, or treating of them in books. A classification may be *artificial*, based, that is, on some one character or set of characters, and will then serve mainly as a convenient and but slightly instructive index ; or it may aim at being *natural*, taking into consideration, that is, all the characters of the plant, and endeavouring by grouping together those having the most general resemblance to reconstruct the genealogy, or to trace the blood-relationship, of the vegetable kingdom (q.v.). Of the first type of classification that known as the sexual system propounded by Carl von Linné (Linnæus) (q.v.) is the best, being based, primarily, on the stamens, their number, relative length, union, etc., and, secondarily, on the styles. The natural system, though foreshadowed by Cæsalpinus, Ray, and Linné, was first thoroughly sketched out by the Jussieus and by Auguste de Candolle. It also is based mainly upon reproductive (*i.e.* floral) structures. It must always in its very nature be of a tentative character. One of the chief difficulties which it encounters is that of distinguishing between resemblances of structure which are merely apparent, functional, or *analogous*, and those that correspond to essential identity of origin or *homology*.

Clastic Rocks, so named from the Greek *klastos*, broken, are taken by modern geologists to

include not merely those commonly called *fragmentary*, such as gravel, shingle, breccia, or conglomerate, consisting obviously of pieces once broken off some earlier rock, but also all other rocks neither crystalline nor glassy, such as fine-grained sediments and precipitates, sand, clay, and gypsum, for example, and those rocks formed of organic remains, of which chalk and other limestones and coal are well-known types.

Claude Lorraine, more correctly CLAUDE OF LORRAINE, or CLAUDE GELÉE, was born at Chamague, in Lorraine, in 1600, his parents being of the humblest class. According to one tradition he was apprenticed to a pastrycook. At the age of 12 he appears to have joined his brother John Gelée, a carver at Freiburg, and to have drawn designs for him. Later on he made his way to Rome in search of work, and worked for a time at Naples under Godfrey Waals, a landscape painter. For two years he served Tassi, another landscapist at Rome, in almost a menial capacity, but he learnt something of art, and sketched assiduously in the open air. In 1625 he made a tour, and for a year assisted Karl Dervent, painting also the ceiling of the Carmelite church at Nancy. Returning to Rome in 1627, he executed a couple of landscapes for Cardinal Bentivoglio, who secured for him the favour of Pope Urban VIII., and his fortune was then made. He not merely possessed an instinctive feeling for all the varying phases of Nature, but he studied them also from a scientific standpoint. He was laboriously painstaking in his work, never resting satisfied till he had got the desired effect. His pictures are full of light and air, the distances being marvellously represented, the colouring rich yet delicate, and the various objects harmoniously illuminated. He failed in his figures, for which he had frequently recourse to Curtois, Lauri, and other artists. He kept tinted drawings of all the pictures he sold, with the date and price of each, and these volumes, still reproduced, he named *Libri di Verità*, as giving the means of identifying his works at once. He was an etcher, too, of no mean skill. Though uneducated, he was a man of natural refinement and gentleness, beloved by his pupils, to whom he freely opened out his vast stores of practical knowledge. He died at Rome in 1682, leaving a considerable fortune.

Claudian, or CLAUDIUS CLAUDIANUS, was of Egyptian origin, and probably born at Alexandria about 365 A.D. We know nothing of his parentage, education or early life, but he tells us that his first literary attempts were made in Greek, whilst his command of Latin makes one suppose that it was his native tongue. He came to Rome in 395, and made his début with a panegyric on Olybrius and Probius, the consuls. Between that date and 404 he produced his various complimentary poems to the Emperor Honorius, his epithalamium on the emperor's marriage with the daughter of Stilicho, his encomiums on Stilicho's victory over Alaric (*De Bello Getico*), and his consulship, together with the *Rape of Proserpine*, and the other works on which his fame rests. Through the patronage of Stilicho's wife Serena he is said to have made a wealthy

marriage in Africa. He seems to have been living in 408, and in 415 or 416 he is supposed to have been dead. In him revived for a brief and final outburst the genius of classical poetry. His versification is tame and monotonous; his diction is now and then turbid and weak; his subjects are far from inspiring. Yet we can pass from Ovid, Catullus, or Propertius to Claudian without feeling absolute loss of continuity, whilst here and there flashes of real feeling and great dignity are found in his works.

Claudius, the name in Roman history of two gentes, the one patrician, the other plebeian. Some members of the former, including Cicero's famous opponent, modified the spelling to Clodius.

Claudius, APPIUS, CÆCUS, a statesman who effected some remarkable changes in the Roman constitution. Elected censor in 312 B.C. he retained office against the law for five years. He broke through caste privileges of the patricians by openly causing to be published the *legis actiones* and the *dies fasti*, thus putting the forms of procedure within reach of all. He distributed the *libertini* among the tribes, and raised Caius Flavius, a freedman, to the senate. He originated the Appian Way and the Appian Aqueduct, the first public works stamped with the name of their author. Though victorious in Samnium as consul in 296 B.C., he had no military reputation. He was, however, a keen patriot, and stirred his countrymen to reject the overtures for peace made by Pyrrhus through Cineas. He was the earliest of Roman writers. A few works of his poetical fragments still exist, but his *Sententiæ* have altogether vanished.

Claudius, APPIUS, CRASSUS, notorious for the hatred which his patrician pride provoked amongst the plebs, was consul and decemvir in 451 B.C. In the latter capacity he appears to have endeavoured to usurp permanent power, but his sudden fall was brought about by a celebrated incident of doubtful historical authenticity, commemorated in Macaulay's *Lays of Ancient Rome*. Having become enamoured of Virginia, a plebeian damsel, whose father, Virginius, was on military service, Claudius caused one of his clients to claim her as being really the child of his slave. Claudius, of course, gave judgment in his favour, but Virginius, who had been summoned back from the army, to protect his daughter from shame seized a knife from a butcher's stall and stabbed her to the heart. His act was followed by a popular rising, the decemvirs were overthrown, and Appius died in prison.

Claudius, MARCUS AURELIUS GOTHICUS, was an Illyrian by race. He served with courage and ability under Decius and Valerian, defeating the Goths, Scythians, and Heruli on the northern frontiers. Called to Rome by Gallienus to oppose the Dacian pretender, Aureolus, he was chosen emperor in 268. During his brief reign (he died in 270) he seems to have given proof of many popular virtues.

Claudius, or TIBERIUS CLAUDIUS DRUSUS NEBO GERMANICUS, the son of Drusus and Antonia, and grandson of Livia, was born at Lyons in 10 B.C. Afflicted from his childhood with lameness and defective speech, he was brought up in seclusion

and neglect, devoting himself to literary studies. Caligula promoted him to the consulship, and after the murder of that emperor he was clothed by the Prætorians with the purple (A.D. 41). Personally he displayed an honourable ambition to fulfil the duties of the position. He built the Claudian aqueduct, made the harbour at Ostia, took an active interest in the administration of justice, headed an expedition to Britain, and admitted the Gauls to the higher offices of state. His interests were scholarly—though Suetonius says he always selected the most futile of subjects, such as Who was Hecuba's grandmother? and What language the sirens spoke, and he tried to add three letters to the alphabet. But he was weak enough to yield to the influence of his wives and favourites. He married four times. Messalina, his third consort, was put to death after a career of shameless vice for going through a form of marriage with one of her lovers. The freedmen, Narcissus, Pallas, and Polybius, in turn swayed the counsels of their master, who was wrapped up in the composition of historical works, none of which survive. His last wife, Agrippina, having induced him to set aside his own heir Britannicus in favour of her son Nero, poisoned her husband in 54 A.D. in order to prevent his altering his mind.

Clansel, or **CLAUZEL**, **BERTRAND**, was born at Mirepoix in 1772. His father was a supporter of the Revolution, and the son, entering the army in 1791, fought with distinction in the early campaigns, and in 1799 was a general of brigade. He ably assisted Napoleon in the Austrian campaign of 1809, and in 1810 received a command in Spain. He besieged Ciudad Rodrigo, and lost the hardly-contested battle of Salamanca, where he was severely wounded, but he conducted a masterly retreat of his army. In 1812 he rejoined Napoleon, and was again in the service of the Bourbons. He was sent to America, but in 1830 he was recalled to Algeria, being created a general in 1831. He was not very successful in his operations there, and in 1832 he was recalled to Algeria as governor. He was sent to take Constantine, but he was defeated, and later, and died in 1842.

Clausewitz, **KARL**, was born in Prussian Saxony in 1780. He served in the army of Russia in 1812, and was in the campaign against Napoleon. He published in 1814. He was the director of the Prussian War Academy, and that post he held until his death in 1830. He was posthumously awarded a high reputation.

Clausing, **JOHN**, was born at Kassel in 1791. He studied the university of physics at the University of Würzburg, and was called to the bar in 1814. He was a devoted student of the law, and was called to the bar in 1814. He was a devoted student of the law, and was called to the bar in 1814.

of bodies, but the great task of his life was the investigation of the real nature of heat, and the application of mathematical methods to thermodynamics, electricity, and the expansion of gases. His chief works are *Die Mechanische Wärmetheorie*, and *Die Mechanische Behandlung der Electricität*. He also wrote treatises on mechanical physics and on the nature of heat, and a valuable essay entitled *Das Potential-Function und das Potential*.

Clavaria, a genus of fungi belonging to the *Hymenomycetes* (q.v.) and giving its name to the family *Clavariaceæ*. They have tapering rod-like or coralloid branching bodies, generally white, pink, or yellow; grow among leaves, on rotten wood or in moist grass; and have spores over almost all their surface. *C. vermicularis*, on lawns, resembles a small bunch of white candles, and, like many other kinds, is edible.

Claverhouse, **JOHN GRAHAM OF**, **VISCOUNT DUNDEE**, was born in 1643, being the son of Sir William Graham of Claverhouse, remotely connected with the Montrose family. After being educated at St. Andrew's, he served in the French and Dutch armies. He returned in 1677 and was put by Charles II. in command of a troop of horse with orders to suppress the Covenanters in the West of Scotland. Defeated at Drumclog (1679), he fled to Edinburgh, but returned with Monmouth to take vengeance on his foes at the battle of Bothwell Bridge. By his cruelty, rapacity, and vigour he earned high rewards from the king, and bitter hatred from the people. In 1688 he was raised to the peerage. He failed to stimulate James II. to offer resistance to the Stadtholder, and after the revolution of 1688 gave his professed allegiance to William. However, no sooner had he been sent to Scotland than he began Jacobite intrigues, and succeeded in raising a large force with which he took up a position at Killiecrankie to meet the forces of General Mackay who was despatched to quell the rising. Here Mackay was totally defeated (July 27, 1689), but Claverhouse perished in the fray. He was buried in the church at Blair Athol, but his grave has long since disappeared. The Jacobite partisans endeavoured to throw a halo of romance about his memory, but beyond courage and some slight military ability he had little to recommend him.

Clavicle, or **COLLAR BONE**. Fracture of this bone is not uncommon as the result of a fall on the shoulder or hand. The collar-bone, forming the only direct bony connection of the upper extremity with the trunk, is exposed to especial danger under such conditions. The two ends of the bone readily unite, though there is often some disfigurement, the parts being so difficult to keep in apposition. Dislocation of the clavicle is a rare form of injury.

Clavigero, **FRANCESCO SAVERIO**, was born at Vera Cruz in 1720. He spent thirty-five years in Mexico chiefly as a Jesuit missionary, and collected a vast amount of historical and antiquarian information. On the suppression of the Order there in 1767 he came to Europe, and settling at Cesena in

Italy, compiled his *Storia Antica del Messico*, which was published in 1780. He died in 1793.

Claws, a popular name for the chelæ of the crab, lobster, etc., more properly applied to the epidermic tips of the digits in the lower vertebrates, corresponding to the nails in man. These may be weapons of offence, as in the cats; digging instrument, as in the armadillo; or means of support, as in bats and sloths.

Clay, an earthy hydrous silicate of aluminium. It is very fine-grained, and absorbs large quantities of water, which it holds interstitially. This renders it plastic, or capable of being moulded into and retaining any shape, and also makes it impermeable to additional water. It thus forms a tenacious soil, holding wet on its surface, and is known to farmers as "cold," since much of the sun's heat that falls on it will be absorbed in evaporating the water. When gradually dried, clay falls to an impalpable dust; but when burnt it undergoes partial fusion into the most imperishable substances, porcelain, earthenware, pottery, and brick. Clays seem always to have resulted from the chemical decomposition of felspathic matter [FELSPAR], but may be deposited by either fresh or salt water, and may result from the decay of volcanic pumice, etc., or as an insoluble residue after the removal of calcium carbonate from limestones (at least mainly) organic. *Kaolin* (q.v.) is a very pure clay, free from iron or alkali, used for china, resulting especially from the decay of the felspar in granite. Pipe-clay, as in the Eocene rocks of Corfe, Alum Bay, and Bovey Tracy, is a similar white clay which shrinks too much for pottery. Fire-clay, also free from iron and alkali, as in the beds below coal-seams known as "seat," or "bottom," clay, contains free silica and resists intense heat without melting. Most clays contain potash, iron-oxides, and some magnesia, the iron-salt colouring them blue before exposure to air, then brown (on its hydration), and the familiar red of brick, when burnt. Clays belong to almost all geological periods; but those of the older series are mostly compressed into slates or shales. Among the most important clays are the Lias, Oxford, Kimmeridge, Gault, and London clays, all marine and at first blue; the Weald clay, blue and freshwater; the Plastic, Mottled, or Woolwich and Reading clay, estuarine; the Boulder-clay, with fragments of other rocks, of glacial origin, often chalky and almost white; the brown "Clay with flints," the soil resulting from the surface decay of the Chalk; the *terra rossa*, or similar red-brown earth on other flintless limestones; and the red cave-earth, formed similarly within caverns. In no rocks are fossils more delicately preserved than in clays.

Clay, CASSIUS MARCELLUS, the son of a well-known pioneer, General Green Clay, was born in Kentucky in 1810, and was a member of the Kentucky Legislature, where he spoke in favour of Abolition, and against the annexation of Texas. He edited *The True American*, an abolitionist paper, and incurred unpopularity and even danger

by his opposition to slavery. In 1846-7 he served with distinction in Mexico. Lincoln, whom he supported, made him minister to Russia in 1863. He was recalled in 1869, and died soon afterwards. Horace Greeley edited and published his writings and speeches.




Clay, HENRY, the son of a Baptist minister in Virginia, U.S.A., was born in 1777. Left an orphan very early, he obtained a legal education after much difficulty, and soon won a large practice by his oratorical powers. He took an active interest in politics, urging the partial abolition of slavery in 1799, though later on he assented to the Missouri Compromise, and as late as 1850 supported the discretionary retention of slavery in the territories acquired from Mexico. In 1803 he entered the Kentucky Legislature, of which he became speaker in 1808, fighting rather a memorable duel in that year. In 1811 he was returned to Congress, and became speaker. His energies were devoted chiefly to forcing on the war with England, and he assisted in 1814 in concluding the Treaty of Ghent, by which that brief struggle was terminated. In 1824 he was nominated for the Presidency, but transferred his votes to Adams, whose election was thus secured, Clay becoming Secretary of State. It was on this occasion that he fought his famous duel with John Randolph. He thrice contested the Presidency in after years, but was defeated. One of his chief political aims was the liberation of America from European control. Though he wavered at times, he was on the whole a Protectionist. After a brief withdrawal from public affairs he came back to the senate in 1848, and carried in 1850 his Omnibus Bill to avert the disruption of the States on the slavery question. He died in 1852.

Clay Iron Stone, an impure carbonate of iron, containing considerable quantities of clay, which is largely employed for the production of iron; the greater quantity of the metal smelted in England being obtained from this ore. It is of a light to dark-brown colour, sometimes black owing to carbonaceous matter (black band), and occurs largely in the clay and shales of the coal measures.

Claymore, a compound Gaelic word from a word cognate to Lat. *gladius*, and English *glave*, and the epithet *mor*, great (cf. MacCallum More, Dugald Mohr, Arranmore). The name was first applied to the great two-handed Scottish sword, such as Lindsay is described in *The Monastery* as carrying on his celebrated visit to Queen Mary at Loch Leven—a sword so long as to be carried on the back, and drawn from over the shoulder—an apparently impossible feat. Later the name came to be applied to the basket-hilted broadsword, which formed part of the equipment of a Highland gentleman, and is still carried by the officers of a Highland regiment. The cry of "Claymore" had the same significance for a Highlander as the cry of "Clubs" for a London apprentice of the olden time. Many an Andrea Ferrara blade became a Claymore.

Clearing-house, with banks and also a central office where the different banks or railways entered, coming or receiving institution, caused to running fluctuating. And the railways that each other's mutual complicated accumulated £50,000 when the bank amount of

Clef, in *Music*, a character placed at the beginning of a stave, to indicate the pitch and

names of the notes on that stave. The number of clefs in common use is three, viz.: the Treble or G-clef, represented thus, ; the Bass or F-clef, ; and the Tenor or C-clef, . Other clefs which were formerly in use are the Soprano, the Alto, and the Gregorian clefs.

Clematis, a genus of shrubs belonging to the order *Ranunculaceæ*, comprising about 100 species. They usually climb by twisting the stalks of their opposite leaves round a support. They are also exceptional in the order in the leaves being usually pinnately compound, in having a petaloid calyx of four valvate sepals, but no petals, and in the long feathery tails or awns of each of the achenes in their fruits. From this last character the only British species, *C. Vitalba*, the traveller's-joy, gets the name old man's beard. Several species are grown in gardens besides various hybrids, of which the large purple *C. Jackmanni* is the type.

Clemens, SAMUEL LANGHORNE, better known by his *nom-de-plume* of "Mark Twain," was born in Missouri in 1835. He began life in a printing office, but engaged in a variety of pursuits, among them that of a steamboat pilot on the Mississippi. He also won popularity as a reporter for Californian papers, and as a humorous lecturer. In 1867 he published *The Jumping Frog*, and set out on a tour in the Old World, which he described in *The Innocents Abroad*. He married a lady of fortune, settled at Buffalo for some time as editor, and in 1884 established the publishing house of Webster and Co. at New York. Among his most successful books are *Roughing It*, *Tom Sawyer*, *A Tramp Abroad*, and *The Prince and the Pauper*. He has also attempted dramatic composition in *The Gilded Age*, a comedy of some merit. His only serious undertaking has been the compilation of *General Grant's Memoirs*. In 1899-1900 he again visited Europe, and in the latter year appeared a collection of short stories entitled *The Man that Corrupted Hadleyburg*. In 1907 he was made D.C.L. of Oxford and again visited England. In that year, also, appeared his attack on *Christian Science*.

Clemens Alexandrinus, one of the most interesting of the Greek Fathers of the Church, has left but slight traces of his personal history. Eusebius and Photius call him Titus Flavius Clemens "the Alexandrian," but whether he was a native of Egypt or a settler cannot be ascertained. From the internal evidence of his writings we may infer that he flourished in the reign of Severus, about the beginning of the third century, and he appears to have been a disciple of Pantænus, and a teacher of Origen and of Alexander, Bishop of Jerusalem. His minute acquaintance with pagan rites suggests that he was converted in manhood. He appears to have visited Antioch, and it is conjectured that he spent some or all of his later years at Jerusalem. Four of his works have come down to us complete, viz. *A Hortatory Address to Greeks*, *The Pædagogus*, *Stromatis* or *Stromata*, and *Who is*

the Rich Man that is Saved? The first of these is a most elaborate protest against the absurdity and immorality of Greek theology, as contrasted with that of the Christian Church; the second is a practical exposition of Christian duty in the various circumstances of life; the third consists of miscellaneous disquisitions on all sorts of literary and philosophical topics, with a view to explaining the Christian point of view; whilst the last is a sermon on St. Mark's Gospel x. 17-31. Half a dozen other books are known to us only by name, and through fragmentary paraphrases. Chief among them are the *Hypotyposes* or *Adumbrations*, and the Ecclesiastical Canon. Clemens is a valuable author, because he shows us the process by which Christianity and Gnosticism gradually became fused, so as to produce the body of doctrine upon which the churches rest. He was a widely-read scholar, to whom nearly all classical literature was no less familiar than the Hebrew Scriptures and the majority of the books that make up our New Testament. His writings thus preserve many fragments of books otherwise unknown. But though learned, he is not polished, and his style is vigorous rather than graceful.

Clemens Romanus. [CLEMENT I.]

Clement, the name of fourteen occupants of the Papal chair.

Clement I., one of the Apostolic Fathers, is said to have been bishop of Rome from 91 to 100 A.D. Nothing trustworthy is known of his life, but his Epistle to the Church of Corinth is still extant and possesses considerable merit, besides containing some of the earliest references to the canonical books of the New Testament.

Clement VII. (GIULIO DE' MEDICI) was a cousin of Leo X., and was elected pope in 1523, having previously been Archbishop of Florence and Cardinal. He allied himself with Francis I. of France and the Republic of Venice against the Emperor Charles V., with the result that the Imperialists under the Constable of Bourbon sacked Rome in 1527. He resisted the divorce scheme of Henry VIII. of England and in 1534 issued his famous bull against that monarch, dying in the same year.

Clement XI. (GIAN FRANCESCO ALBANI) was born at Pesaro in 1649, and succeeded Innocent XII. in the papacy in 1700. In consequence of his attitude towards Austria the states of the Church were occupied by Imperial troops in 1707. He took up a strongly aggressive position towards the Jansenists, who were gaining head in France, issuing first the bull *Vineam Domini*, and subsequently that known as *Unigenitus*, the latter being specially directed against the work of Père Quesnel, which had secured the approval of the Archbishop of Paris. In 1715 he supported the Pretender in his claim to the English throne, and gave him hospitality at Rome. His learning was considerable, and he patronised the arts liberally. He died in 1721.

Clement, JACQUES, was born at Sorbonne in 1566, and entered the Dominican order. When Henry III. was besieging the Catholic League in Paris, he conceived the idea of assassinating the king, and his fanaticism was encouraged by the Duke of Mayenne. On August 1, 1589, he obtained admission to the palace on pretence of handing a letter to Henry, whom he stabbed to the heart, being cut down himself on the spot by the royal attendants.

Clementi, MUZIO, was born at Rome in 1752. He showed a precocious talent for music, and at the age of nine was so proficient in theory and practice that he was appointed organist at a church, and five years later wrote a promising mass. Beckford, the author of *Vathek*, induced him to come to England, where in 1770 he made his first public appearance with great success. In 1777 he became conductor of the Italian Opera, but soon after went to Paris and Vienna, where his reception was enthusiastic. In the latter city he engaged in a kind of musical contest with Mozart, coming out of the ordeal with high credit. Returning to London, he spent twelve years as a teacher, performer, and manufacturer of pianos. With John Field, one of his ablest pupils, he undertook a long continental tour in 1804, giving advice and instruction to Meyerbeer at Berlin. He came back to England in 1810, but refused to play any more in public devoting himself to composition. He has been justly regarded as the founder of modern pianoforte playing. His skill was remarkable even in his later days, and his great collection of *Études*, known as the *Gradus ad Parnassum*, still remains one of the most valuable works of instruction. He left also about sixty sonatas for his favorite instrument. His death occurred at Evesham.

Cleomedes, a Greek astronomer, whose life and era nothing is known, may have flourished before the Christian era, B.C. He wrote a treatise on astronomy, in which he gave a description of the *Circular Theory* of the universe, in which many later discoveries were anticipated, such as the sphericity of the earth, the rotation of the earth on its axis, the position of the sun, and the system.

[illegible]

policy solely from Thucydides and Aristophanes, who not only belonged to that party but were also personally at variance with the democratic leader, it is probable that history has hardly done him justice. He is generally regarded as the type of a vulgar, loud-voiced, shifty, unscrupulous agitator, trading on the worse passions of an ignorant mob. But he must have possessed vigour and ability, even if they were combined with less estimable qualities.

Cleopatra, the name of several Ptolemæan princes of Egypt, the most famous of them being the daughter of Ptolemy Auletes, born in 69 B.C. Her father dying when she was seventeen left the kingdom to her conjointly with her brother Ptolemy, whose wife she was to become according to the custom of the country. She was, however, excluded from her share, until Julius Cæsar, fascinated by her beauty, took up her quarrel, defeated and slew Ptolemy, and replaced her on the throne. She followed her lover to Rome and lived with him there, to the no little scandal of the citizens, until his assassination. On her return to Egypt she resolved to ensnare Antony, with whom she had already been acquainted in his earlier days. With that intention she went in full regal pomp to meet him in Cilicia, and so completely beguiled the ambitious Roman that he abandoned his great career to sink himself in sensual ease by the banks of the Nile. [ANTONY.] For a brief period he shook off the fatal spell, married Octavia, and entered again into politics. But his infatuation was soon renewed, and Augustus made the wrong done to his sister a pretext for war. In the battle of Actium (31 B.C.) the fleet of Antony and Cleopatra was hopelessly defeated, and the pair fled to Alexandria. When it became evident that Antony's cause could never be revived, Cleopatra is said to have undertaken to compass his death. She proposed that they should both simultaneously commit suicide. Antony destroyed himself in the belief that she had already done so. Possibly she hoped to beguile Augustus as she had beguiled his predecessors, but in this she was disappointed. He resisted her blandishments and purposed to carry her a prisoner to Rome. Rather than suffer such a disgrace she exposed her bosom to the bite of an asp, and perished in the 39th year of her age. She was a woman of considerable intellectual ability. With her the dynasty of the Ptolemies ended. It is believed that she had three children by Antony, and perhaps one by Cæsar.

Clepsydra, a compound Greek word from *kleptein* (to hide), and *hudor* (water), denoting a water-clock. Originally the instrument was simply a vessel containing water which was allowed to escape from a small orifice at a uniform rate, and whose sinking marked in a uniform manner the passage of time. An improvement on this provided a float which either marked the time by its sinking, or by compensatory action caused a balancing weight to rise and mark the time upon a graduated scale on the outside of the clock. Later the use of a dial and needle was introduced. Athens possessed an intermittent fountain somewhat of the nature of a water-clock.

Clerestory (more properly *clearstory*), a term used in architecture, and especially in ecclesiastical architecture, to denote an upper storey with



CLERESTORY, CARLISLE CATHEDRAL.

windows by which the centre of a building is lighted. In some churches the clerestory rises immediately above the aisles, in others the *triforium*, called also the blind-storey, from the fact of its having no windows, comes between.

Clergy, a word used to denote those primarily who are in holy orders, and then extended to embrace all who officiate as ministers or pastors in a place of worship. From the claims of ecclesiastical persons to exemption from the jurisdiction of the ordinary courts of law, and from the further fact that in the Middle Ages the being able to read was almost proof of being an ecclesiastic, sprang the curious English practice of pleading *Benefit of Clergy* (q.v.). Readers of Kingsley's *Hereward the Wake* will remember how Martin's reluctant admission to Prior Brand put him in some danger of being looked on and dealt with as a runaway monk. The Russian Church divides its clergy into the Black and the White, the former name being bestowed upon the monastic orders and the latter upon the secular clergy. The correlative word to the "clergy" is the "laity," and just as this latter word is still often used to denote non-professional men both by physicians and lawyers, so formerly "clergy" was used to denote any one learned or belonging to a learned profession. But to most people the word carries the implication of one who has received episcopal ordination.

Clerk, like clergy, formerly denoted a learned person of any description, and has been so used in modern times. For instance, Coleridge tells us, with somewhat of tautology, how "the devil quoted Genesis like a very learned clerk." And in legal language a clergyman is styled "a clerk in holy orders," thus implying that the two terms are not synonymous. From denoting the ordained clergy, or those who were connected generally with the service of the church, the word came to be applied to the second of the two, who in the 18th century and the early part of the 19th performed the

duet which made up the greater part of the services of the English Church, the first of the two being the incumbent. The transition of the meaning of the word from *ecclesiastic* to the sense of *general secretary* is natural, and the application of the name to assistants of all kinds has brought it about that the original sense has become almost obsolete. We find allusions to thieves as clerks of St. Nicolas.

Clerk OF THE CROWN, CLERK OF THE HOUSE OF COMMONS, CLERK OF INDICTMENTS, CLERK OF THE PARLIAMENTS, CLERK OF THE PATENTS, CLERK OF THE PEACE, CLERK OF RECORDS AND WRITS. [See the several special titles.]

Clerk, JOHN, the son of Sir John Clerk of Penicuik, in Scotland, was born at Eldin about 1730. Though he never went to sea, he took a keen interest in nautical affairs, and wrote an essay *On Naval Tactics, Systematical and Historical*, with plates. In this work he suggested the operation of "breaking the line," adopted first by Rodney with such remarkable success in his victory over De Grasse in the West Indies (1782), and afterwards repeated on many occasions by Howe, Nelson, and other admirals. It has, however, been claimed for Rodney that he invented the manœuvre independently, never having had any communication with Clerk or seen his book. Clerk died in 1812.

Clerk of Assize is the officer responsible for the due performance of the administrative duties of the Courts of Assize on each circuit. He performs the same duties on circuit which the associates formerly, and now the masters, perform at the Nisi Prius sittings in London, and he also acts as Clerk to the Crown on circuits, by which apparently is meant that he performs similar functions when the Courts of Assize are sitting for criminal business. On several circuits, however, the Clerk of Assize rarely attends the court, his functions being wholly or partially performed by his deputy, who also acts as Clerk of Assize or Clerk of Indictments on the same circuit.

Clerkenwell, a district and outlying parish of the City of London, comprised within the Metropolitan borough of Finsbury. Situated on the east bank of the Fleet, it derived its name from one of the springs that fed the stream. The *Fons Clericorum* was marked until recent years by a pump. The Priory of St. John, the chief abode in England of the Knights Hospitallers, was founded here in 1100, but the gate that now exists, and belongs to the modern representatives of the order, dates only from 1504. It is a fine specimen of the Perpendicular style. Here Dr. Johnson used to write for Cave, the founder of *The Gentleman's Magazine*, and in a kind of museum on the upper floor his chair and other relics are preserved. At the end of the sixteenth century the neighbourhood contained many aristocratic residences, as is testified by the names of several of the streets. It acquired later on a very evil reputation, more especially that portion of it known as "Hockley in the Hole," a haunt of thieves until late in the 19th century. The modern Sessions House

long prisms of carbonate of lime obliquely arranged: they have no anus (whence the name "closed guts"). These are the three characters that separate them from the TRETENTERATA. The Clistenterata include the great majority of the Brachiopoda, and many of the best known forms; for example the common "Lamp Shell" (*Terebratula*), found rarely in the deeper waters of our coasts; also *Waldheimia*, an allied genus, and *Rhynchonella*, species of both of which occur living in the British area. Most of the species and several of the families are, however, extinct; thus the *Spiriferidae*, which had a complicated spiral support for the arms, and the large thick-valved, and often concavo-convex *Productidae*, are almost limited to the Palæozoic age. In many extinct species and one living one (*Rhynchonella dæderleini* from Japan) the shells are covered with long spines.

Clitellum is a ring round the body of a worm caused by the expansion of the walls of several segments by the development of glands connected with copulation.

Clitheroe, an English manufacturing town and municipal borough, near the Ribble, in the county of Lancashire, at the foot of the Pendle Hills, 28 miles N. of Manchester. Its industries are cotton and paper manufacture, iron founding, and lime and brick-works. It played an important part in the Scottish wars, and also in the Civil war, during which (1649) the castle was dismantled. Stonyhurst College is near Clitheroe. Pop. (1901), 11,414

Clive, CAROLINE (1801-1873), an English novelist and poetess, daughter of Mr. Meysey Wigley, and wife of the Rev. Archer Clive. She is chiefly known by her novels of *Paul Ferroll* and *Why Paul Ferroll killed his Wife*.

Clive, KITTY (1711-1785), an English comic actress, the daughter of an Irish lawyer named Raftor. Most of her playing was at Drury Lane from 1728 to 1769, in which latter year she retired to Twickenham. In 1731 she married a barrister named Clive, but soon separated from him. She was a friend of Garrick, Handel, and Horace Walpole, and between Dr. Johnson and her there was a mutual liking.

Clive, ROBERT (1725-1774), Lord Clive and Baron Plassey, is generally looked on as the virtual founder of our Indian empire. Born in Shropshire, he went in his nineteenth year to India as a writer under the East India Company, but soon quitted that employment for the army. He acted so well in attacking a fort of the Rajah of Tanjore, that he was appointed commissary. His next exploit was to advise and carry out an attack upon Arcot, which resulted in a victory and the drawing off the French from Trichinopoly. After several other victories, Clive embarked for England, and there received a present from the Hon. East India Company, and was made lieutenant in the royal service. On his return to India he marched against Surajah Dowlah, and by the battle of Plassey completely broke his power. He was made Governor of Calcutta, and had firmly established the English power before he returned to England to be rewarded

with a peerage. Once again he returned to India, but took no further part in military matters, although his political measures were of great service to the empire. In 1767 he came for the last time to England with rank and great wealth, only to meet the reward that often awaits those who have worked for their country. He was accused in the House of Commons of having abused his power, and the injustice of his enemies, though it failed, drove him to commit suicide. Lord Macaulay and Mr. Gleig have made us familiar with the events of Lord Clive's life, and there is a portrait of him in the National Portrait Gallery.

Cloaca, the chamber into which the intestinal canal and the urinary and generative ducts open in some invertebrates and fishes, in all amphibians, reptiles, and birds, and in the Prototheria (q.v.).

Cloaca Maxima, the Latin name of a large drain or tunnel, formed by Tarquinius Superbus or by Tarquinius Priscus, to drain the marshes which made some of the low-lying parts of ancient Rome well-nigh uninhabitable. The work was so well done that much of it remains to this day, and its preservation was made a matter of importance at several epochs of Roman history.

Clocks, a word by etymology meaning a bell, was at first applied to such time-measuring instruments as were fitted with a bell or bells whereon the intervals of time were mechanically struck, and then, by extension, to any time-measuring instrument, and lastly to such of these instruments as are too large to be conveniently carried about the person. In these days of tiny carriage clocks it would be difficult to draw a line of real distinction between a clock and a watch. To attempt a history of clocks or a description of them would require a volume. Clock-making has formed a fascinating study for many people; and many ingenious dispositions of mechanism have been applied to them. The great clock of Strasburg is well known, and in fiction most people are acquainted with the major's clock in Wilkie Collins's *Armada*. The collection of clocks at the British Museum is of great interest whether from a mechanical or ornamental point of view. The ancients used water-clocks [CLEPSYDRA] and sand-glasses to mark the time. From an ornamental point of view French clocks hold a high place, but they are not renowned for going qualities. Among English clocks that of Westminster is one of the most remarkable, not merely on account of the gigantic scale of its accessories, but also for its wonderful accuracy, since its average deviation only amounts to a second a week. The Swiss are noted for their clock and watch-making.

Clog Almanac, a form of almanac anciently in use, consisting generally of a four-sided piece of some hard wood upon which the different days of the year were marked down. Each side would contain three months, the days being marked by notches, the first day of the week having a larger notch than the others, or otherwise distinguished, and against festivals or other remarkable days symbols were drawn to denote them. Some of the existing almanacs have Runic (q.v.) characters.

Great variety of style naturally existed in their arrangements. Many museums contain specimens.

Cloister (Lat. *claustrum*, an enclosure), the name applied to a passage running round (generally) the inner wall of a monastic building, built in a quadrangular form, and looking upon the central enclosure. It was intended usually to permit the monks to enjoy the open air without being entirely exposed to the weather while carrying on their education, work, or meditation, or taking exercise. Some English cathedrals have cloisters, and the cloisters of Westminster Abbey are familiar to many people. New College and Magdalen College, Oxford, have good cloisters. The cloisters may be open to the ground on the exposed side, or built half up and lighted in the upper part by arcades, or may, as in some modern buildings in Great Britain, be lighted by glazed windows; but the same general idea of a passage into which rooms open runs through them all. The Campo Santo at Pisa has a famous cloister. By metaphor the term cloister is sometimes used to denote the profession of religion, while again the term "cloistered," as applied to religions, has a special and distinct signification.

Clonmel, a municipal borough of Ireland, on the Suir, in the province of Munster, in the counties of Tipperary and Waterford, 104 miles S.W. of Dublin. Part of the town is built upon two islands in the river, which are connected with the mainland by three bridges. The river is navigable for barges of fifty tons as far as Waterford, and the town possesses a brewery, flour-mills, and tanneries, and there is a trade in butter, cattle, and grain. Sterne was born at Clonmel.

Clootz, JEAN BAPTISTE, BARON (1755-1794), generally known as Anacharsis Clootz (which name he assumed after a romance of the Abbé Barthélemy), was born near Cleves. Being rich, he was sent to Paris, where an anarchist uncle imbued him with revolutionary ideas. After travelling, he returned to Paris, and posed as the orator of the revolution. In 1792 he became a member of the Convention, and voted the king's death on 17th January. With all his folly his revolutionary ardour was both feared and respected. He excluded him from the Convention, and he was involved in a plot to assassinate Robespierre and his adherents. He was guillotined in 1794, preaching martyrdom to the last.

Close Time, a term applied to the State of the country, when the game is closed, or other animals are not to be killed, or their destruction is prohibited, or, if not prohibited, it is to be prevented. Formerly, the game was closed by the State, and the principle has now been extended to other animals.

Clove, a term, perhaps originally implying cleavage or separation, applied to the small buds or bulbils formed in the axils of the scales of bulbs as in garlic, by which bulbs multiply. It is still more commonly applied to the dried unopened

enable a debate in the Parliament to be summarily finished at the will of a certain majority. By the English rules of procedure any member may, with the consent of the Speaker or the Chairman, move that the question be now put, and if a majority of 200, or a majority of 100 against a minority of 40 or less, support his motion, the question is immediately put.

Clothes Moths, the Tineidæ, a family of Microlepidoptera, the larvæ of which feed on animal fabrics and thus damage clothes, etc. *Tinea tapetzella* is one of the commonest species.

Clotho, one of the three Fates—the daughters of Necessity—who spins the thread of man's life, which at the full time allotted, her sister, Atropos, severs with her shears.

Clotilda, St. (475-545), daughter of Chilperic of Burgundy, and wife of Clovis, King of the Franks, whom she converted. Her vengeance upon her uncle for the death of her father, mother, and brothers, brought about the union of Burgundy with France. After her husband's death she retired to Tours, where a church and statue perpetuate her memory. Her bones were burnt at the Revolution to prevent their desecration.

Clouded Tiger (*Felis macrocelis*), a large arboreal cat, ranging from the Eastern Himalayas to Borneo and the adjacent islands. It is about 42 inches long to the insertion of the tail, which is some 32 inches more. The ground colour is brownish grey, marked with large irregular blotches and stripes of black. It preys on sheep, goats, pigs, and dogs.

Clough, ARTHUR HUGH (1819-1861), an English poet, born at Liverpool of a Welsh family. His father, a cotton merchant, took him to Charleston, where he lived for some years, but was brought back to England and sent to school at Rugby, where Dr. Arnold thought much of him. In 1836 he passed on to Oxford, and in 1842 was chosen one of that charmed circle, the Fellows of Oriel, and tutor the year after. But he did not escape the religious fermentation of the time, and the sceptical habit of thought that he had developed forced him to resign his position. He first went to Italy, where he was present at the siege of Rome in 1849, and in 1852 he went to America, soon after returning to become an examiner in the Education Office. Made ill by overwork, he again travelled to Greece and Constantinople, and in 1861 he started again for the south, dying at Constantinople. Of his poems, perhaps the most widely known is the *Bothie of Tober-na-Vuolich*, written before he left Oxford. Another favourite is *Dipsychus* (1850). His lyrics are much admired and throughout his works there reigns the same sincerity, search after truth, and humour. Matthew Arnold has eulogised him in *Thyrsis*.

Clove, a term, perhaps originally implying cleavage or separation, applied to the small buds or bulbils formed in the axils of the scales of bulbs as in garlic, by which bulbs multiply. It is still more commonly applied to the dried unopened

flower-buds of the small evergreen myrtaceous tree *Eugenia caryophyllata*, a native of the Moluccas, the cultivation of which was once restricted by the Dutch to the island of Amboyna, but is now extensively carried on in Penang, Zanzibar, and the West Indies. Here it is derived from the French *clou*, a nail, from the form of the bud with its long receptacular tube enclosing the inferior ovary. The fruits are imported as *mother cloves*, and the stalks are used to adulterate the spice when ground. The whole plant is aromatic from the presence of the essential *oil of cloves*, which occurs to the extent of 16 to 18 per cent. in the flower-buds. It is used in soap-making and perfumery extensively, and also in medicine, especially for tooth-ache.

Clovelly, a village on the coast of N. Devon, a few miles south-west of Bideford. Many who have not visited it are familiar from photographs, and descriptions by Kingsley and others, with the steps, and the white flower-covered houses rising tier upon tier to a height of several hundred feet.

Clover, from their leaves being cloven into three leaflets, is the name specially applied to the species of the leguminous genus *Trifolium*, cultivated as fodder-plants, and to a few similar plants. *Trifolium* is distinguished by the stipules adhering to the leaf-stalk, the small flowers crowded in a head, and the short, straight pod. The chief cultivated species are *T. incarnatum*, carnation clover, with long heads of deep crimson or white flowers; *T. pratense*, broad-leaved clover, and *T. medium*, zigzag clover, so-called from its bent stems, with deep pink flowers; and *T. repens*, Dutch or white clover, the shamrock (q.v.) of Ireland, and *T. hybridum*, alsike or so-called "hybrid" clover, with white or pink-tinged flowers. There are several other wild species in England. Bokhara clover, *Melilotus alba*, is an allied plant yielding much honey and very aromatic hay, which is a native of Britain.

Clovis (465-511), King of the Salian Franks belonging to the Merovingian line, and being the son of Chilperic I., whom he succeeded in 481. His first capital was Tournai, but after overthrowing the Gallo-Romans he transferred his court to Soissons. In 493 he married Clotilda (q.v.), and under her influence, and owing to the supposed aid of the God of the Christians in one of his battles, he became Christian, and, with many of his subjects, was baptised by St. Remigius. The Pope conferred on him the title of Most Christian King to mark approval of his orthodoxy in the midst of many Arians. In 507 he defeated Alaric the Visigoth, thus carrying out in a great measure his ambition of uniting the Franks under one ruler, but in the same year he received a check from Theodoric, king of the Ostrogoths. Thereupon he settled in Paris, where he died, after dividing his kingdom among his four sons.

Clowes, WILLIAM (1540-1604), a distinguished English surgeon, who was surgeon at St. Bartholomew's, served in the Low Countries, and on board the English fleet during the Spanish invasion.

He became surgeon to the Queen, and published several surgical works.

Club, by etymology, a clump or knot of men permanently united for any purpose, social, political, or other. The clubs of ancient Greece played an important part in the national politics, as they do also in modern times. The Carlton Club, the Reform Club, the National Liberal Club, in England, are well known, as are also the legion of social clubs which give to one part of London the nickname of "Clubland." The club, too, is a convenient method of promoting intercourse among the members of a profession, or those interested in any particular pursuit. The Travellers', the Oriental, the Athenæum, the Universities', the Services' Clubs are instances in point. Almost every amusement or pursuit of Englishmen is represented by its numerous clubs. Some consider the name to have been derived from the idea of clubbing or massing the expenses and dividing them equally among the members of the society, but this is doubtful, and at any rate is not of the essence of a club as now understood.

Clubfoot, a deformity of the foot caused by a contracted or shortened condition of some particular muscle or muscles. The malformation is usually congenital, i.e. exists from birth, and if neglected the parts adapt themselves to their unnatural relationship to one another, and the chance of cure becomes increasingly remote. The most common form of congenital clubfoot is called by the surgeons *talipes varus*. The child walks on the outer side of the foot, and in order to bring about the natural condition of things certain tendons may require to be divided (the tibialis anticus and posticus, and often the tendo Achillis) with a tenotomy knife. After the operation care must be taken to ensure that healing takes place in such a way that the foot is restored to its proper position. In *talipes equinus* the heel is drawn up by the shortening of the muscles of the calf; in *talipes calcaneus*, on the other hand, the foot is flexed and the toes lifted off the ground, so that the patient walks on his heel. In *talipes valgus* the peronei muscles are contracted and the sole of the foot looks outwards. Apart from congenital clubfoot, a paralytic form must be distinguished. Here the mischief is started by a paralysis, affecting some muscle or group of muscles attached to the foot. The antagonists of the muscles involved are now unopposed, and drag the foot from its natural position. In such a state of things operative treatment is less likely than in the congenital disease to be of avail. For, unless there is a restoration of the lost power in the paralysed muscles, there can never be a return to the natural conditions of health.

Club Mosses, two allied groups of plants, the *Lycopodiaceæ* and the *Selaginellaceæ*, resembling one another in general habit but differing much in their reproductive and minute structure. Though having some resemblance to mosses, they belong to an altogether higher grade of organisation, more nearly allied to ferns. At the present day they

are neither numerous nor of large size; but in Palæozoic rocks they are represented by gigantic forms, such as *Lepidodendron* and *Sigillaria* (q.v.), which have largely contributed to the formation of coal (q.v.). The chief existing genera are *Lycopodium* and *Selaginella*, which occur over the whole globe. They have thread-like, and generally procumbent branching stems covered with overlapping minute pointed leaves, and terminating in the club-like leafy spore-bearing cone from which the popular name is derived. *Lycopodium* produces only one kind of sporangium and spore, and is thus *isosporous*; *Selaginella* bears two kinds, *megasporangia* containing four relatively large female *megaspores*, and *microsporangia* enclosing numerous small *microspores*, and is thus *heterosporous*. The *megasporangia* correspond to the ovules and the *microspores* to the pollen-grains in the higher plants. Several kinds of *Selaginella* are grown for the beautiful metallic lustre of their leaves, and the spores of our British *Lycopodium clavatum*, or stag's-horn moss, are collected in Germany to cover pills, and to make theatrical lightning and other fire-works, they being oily and readily inflammable.

Clugny, or CLUNY, a French town on the Grône, a tributary of the Saône, in the department of Saône-et-Loire. It was renowned in the Middle Ages for the great Benedictine abbey, which was the parent of almost 2,000 affiliated convents in different parts of Europe. Cluny was second only to Rome in ecclesiastical importance, and its abbey church was second to none in Christendom before the building of St. Peter's at Rome. Of this only a few fragments remain. In 1790 the order was suppressed, and the magnificent library and records, which had been attacked and dispersed by the Huguenots (1652) and then strangely restored, was again attacked, scattered, and burnt in 1793; but much has been again recovered, and is carefully stored in museums. The town is of almost value for the light it throws on the history, and contemporary affairs of France. It is the seat of agricultural trade, and is a great manufactory of paper, pottery, and woollen goods. This Cluny had a house of the Cluniac monks. This is now a museum of the Cluniac monks.

Clupeidæ, a family of fishes, the members of which the herring (p. 100) is the most common.

Clyde, one of the largest rivers, third in population and commerce. Coming from the north rise at a high level at the Dumfries flood-time and fall to the sea at Glasgow. There are three great locks, the most of 84 ft. in height. The river has draughts of 30 ft. and stands so

width from one mile to nearly 40, and is 68 miles long, is one of the most important waterways of the world.

Clypeaster, a genus of irregular Sea Urchins, found most commonly in the rocks belonging to the Miocene system in the Mediterranean basin. One of the largest and best known species is *C. ægyptiacus*, common in Egypt. The Clypeasters are large, generally flat-based, provided with jaws, and with both the mouth and anus opening on the lower surface.

Clyster. [ENEMA.]

Clytemnestra, in Greek mythology, daughter of Tyndareus, brother of Castor, and wife of Agamemnon, king of men, by whom she became mother of Iphigeneia, Electra, and Orestes. She slew her husband Agamemnon and Cassandra, who had fallen to his lot as mistress, as she herself alleges in *Æschylus' Agamemnon*, through jealousy of Cassandra, and to revenge the death of Iphigeneia. During Agamemnon's absence at Troy, however, she had lived with a paramour, *Ægisthus* (q.v.), with whom she was at last slain by her son Orestes (q.v.).

Cnidaria, a proposed subdivision of the Cœlenterata, including the Hydrozoa and Anthozoa, based on the presence in these of "thread cells." It thus emphasises the absence of those structures in the sponges, and the great affinity between the two groups to which it is applied.

Cnidus, now Tekir, a city of Caria in Asia Minor, chief city of the Doric league, and a flourishing port of antiquity. It is renowned for the sea fight in 394 B.C., and victory of Conon with his Athenians over Pisander with his Spartans. Aphrodite was specially worshipped here, and Praxiteles' famous statue of her was in one of the temples.

Coach, a word derived by some from the Latin owing to its resemblance to a shell, and by others from a Hungarian word, used to denote a covered vehicle formerly used by the rich as a mode of conveyance, and then applied to public conveyances used for the transport of passengers or mails, or both. The hackney coach was a common feature of London life half a century or more ago. The name is sometimes applied to railway carriages, which were at first built so as to resemble as much as possible the lines of a coach-body. A reaction has widely set in of late, both in England and elsewhere, in favour of employing coaching as an agreeable mode of travelling during the summer months. It is not so very long ago that people of rank travelled from place to place in their own coaches, which were drawn by post-horses. The verb and substantive "coach," used in an educational or cramming sense, must be considered to come under the head of Slang (q.v.).

Coach Dog. [CARRIAGE DOG.]

Coagulation. [BLOOD.]

Coahuila, a Mexican state bordering on Texas, from which it is separated by the Rio Grande.

Silver, coal, and other minerals have been found, and the state is generally fertile, but hitherto has been little developed.

Coaita, the native name of *Ateles paniscus*. [SPIDER MONKEY.]

Coal, a compact and usually brittle black rock, containing from 75 to 85 per cent. of carbon, burning readily with a clear flame, and composed of the compressed and altered remains of former vegetation. As this carbon was obtained from the air by the action of green plants under the influence of sunlight, the energy latent in coal has been correctly described as "bottled-up sunshine." [CHLOROPHYLL.] Though the "Better-bed" coal of the Newcastle coal-field is almost wholly made up of the sporangia of club-mosses, no trace of organic structure is usually discernible in coal. This is probably explicable by a fermentative process having taken place in the wood-fibre of the plants whilst naturally macerating in water, nitrogenous matter having thus converted this fibre into a morrhous dextrinous or mucilaginous matter, with which the siliceous or other earthy impurities constituting the "ash" are most intimately mingled. Wood fibre seems to have undergone a slow oxidation under water, so that the action of air was excluded, losing about 75 per cent. of its weight, much of its hydrogen and oxygen, and almost all its alkaline constituents.

Coal occurs in beds or seams belonging to various geological formations, though mostly to the upper part of that known in consequence as the Carboniferous (q.v.). The plants concerned in its formation differ according to its geological age: those of the Carboniferous and other Palæozoic formations were mainly club-mosses (*Lycopodinae*), horse-tails (*Equisetaceae*), and ferns. In the Trias and Jurassic, cycads predominate; and in the Brown Coal of the Oligocene of Germany, exogenous angiosperms prevail. Though some local patches of coal of great thickness may be due to the drifting out to sea of rafts of vegetable matter, the seams have usually a bed of fire-clay or shale below them which is often penetrated by roots (*Stigmaria*), continuous with stems in the coal itself, and demonstrates the seam to have been formed by the accumulation of vegetable matter which grew on the spot, the clay or shale being the ancient soil.

Seams vary in thickness from less than an inch to several feet, those between 3 and 7 feet thick being usually most constant, while very thick seams are really each several seams with thin shaley "partings." The "ten-yard" seam of South Staffordshire is made up of eight such seams. The upper part of the Carboniferous System (q.v.), a great series of sandstones and shales, with occasional beds of fire-clay and coal, known as the Coal Measures, has in most countries been much disturbed by subterranean movement, and thrown into folds of which the horizontal and anticlinal (q.v.) portions have been generally denuded, so as only to leave isolated synclinal areas or *basins*, and the districts over which these areas are worked are known as *coal-fields* (q.v.). This folding has produced jointing (q.v.), so that coal commonly breaks

up into roughly cubical pieces, having two glass surfaces, or *cleats*, along the master-joints, the direction in which the main galleries of a mine are usually carried, two more irregular *ends* and two powdery surfaces of bedding. Some coal breaks down into dust or *slack*. *Faults* (q.v.), known locally as *heaves* or *troubles*, i.e. dislocation of the strata, are also common in our coal-measures; and in some cases, as in the South Wales coal-field, folding has caused a gradually increasing intensification of the carbonising process, so that the same seam passes from the condition of coking coal in the east through that of steam coal, to that of anthracite (q.v.) in the most contorted western part of the field. Gases, especially marsh-gas or *fire-damp* (CH_4), often occur in considerable quantity in coal and escaping into the workings, especially when atmospheric pressure is reduced, may, on contact with naked lights, produce serious explosions.

Among the chief varieties of coal are lignite, caking coals, cannel coal, bituminous coal, and anthracite (q.v.). *Lignite*, or brown coal, mostly Tertiary in age, contains less than 70 per cent. of carbon, much oxygen and ash. *Caking* or *coking coals* are so called from softening when heated, so that when air is excluded most of the carbon remains in a compact mass known as *coke*. *Cannel coal*, so called from its flaming readily like a candle with a low carbon percentage, contains so much "disposable hydrogen," i.e. hydrogen beyond that needed to form water with its oxygen, as to be the best gas-making coal. *Bituminous coals* are misnamed, since they contain no bitumen; but at low temperature they are partly fused and form hydrocarbons.

We have, perhaps, no exact existing analogue of the formation of coal, the nearest approach to it being probably the mangrove swamps and cummerbunds of low-lying tropical coasts in which arboreal vegetation spreads out into sea-water. The whole series of coal-measures was laid down during a period of prolonged but intermittent subsidence, the commencement of each seam marking a pause in, and its upper termination the recommencement of, such sinking.

Coal Fields differ greatly in size. There are about twenty in England and Wales, but half of this number are but small in area. The largest is that of South Wales, with a total area of about 1,000 square miles, about half of which yields anthracitic and the other half bituminous coal. Other important fields are the Northumberland and Durham, the York, Derby, and Nottingham, the Cumberland, the South Lancashire, the North Staffordshire, the South Staffordshire, the Flintshire and Denbighshire, the Forest of Dean, and the Bristol and Somersetshire. The five principal coal fields in Scotland are those of Ayrshire, Lanarkshire, Stirling, Fife, and Midlothian, in addition to which there is the small Jurassic coal-field of Brora, in Sutherlandshire. Of the but little developed coal-fields of Ireland, those of Leinster, Tipperary, and Munster, the most important are anthracitic, that of Tyrone is bituminous. The total output of coal in the United Kingdom during

the last ten years has been of the average annual value of £90,000,000 sterling. The Royal Commission in 1870 estimated the available unworked coal in the kingdom within 4,000 feet of the surface at 146,454,000 tons, or more than 1,260 times the amount consumed in 1870. Increasing consumption in manufactures and increasing population have, however, caused some authorities to limit the duration of our supply to 360 or even to 276 years. According to a report of another Royal Commission, issued in 1905, the available quantity of coal was estimated to be 100,914,668,167 tons. The excess over the estimate of 1870 is accounted for partly by the difference in the areas regarded as productive by the two commissions, and partly by discoveries due to recent sinkings and more accurate knowledge of the coal seams. The Commission of 1905 would not state how long our coal resources were likely to last. Though the coal-fields of the United Kingdom, with a total area of 12,000 square miles, now yield two hundred and sixty-seven million tons, or more than half that of all other countries put together, this is only owing to the undeveloped state of the resources of these latter. Thus the United States, with fields estimated at 192,000 square miles, only produce three hundred million tons, whilst China, with 200,000 square miles, only produces three million. Germany produces one hundred million tons, France thirty million, and Belgium twenty million; but Canada, with a coal-bearing area of 65,000 square miles, India with 35,500, New South Wales with 24,000, and Russia with 20,000, produce far less.

Coal Fish (*Gadus virens*), a fish of the cod family, abundant on the North American coast, and ranging into the Mediterranean. It is very voracious, and occurs in large shoals; the upper parts are black, lighter below. The average length is about three feet. The flesh is excellent, and the fish is dried for export like cod (q.v.).

Coal Gas. The ordinary gas employed for illuminating purposes is obtained by the distillation of coal. For its production the coal is heated to a bright-red heat in retorts built of firebricks. A gas is evolved which remains in the retort, and which require to be passed first into a large vessel containing a watery distillate called *ammoniacal liquor*. The gas then passes next into the gasometer, where it is collected, the gas passing through a system of iron pipes, the retorts, and the tar and ammoniacal liquor are collected. The gas then passes through iron towers, where it meets a stream of water, and is scrubbed in a marsh gas, carbonic oxide, and retorted liquor, carefully, and the effects, and silver and gold.

in the *purifiers*, over layers of a mixture of slaked lime, oxide of iron, and sawdust, which absorb these noxious constituents. From the purifiers the gas is collected in the large gasometers, from which it is distributed to the mains, the supply being regulated by a governor. The best coal for use in the manufacture of coal-gas is that non-flaking coal found largely in Staffordshire, Newcastle, Wigan, etc. The illuminating power of gas is reckoned in terms of standard sperm candles, against which it is tested when burning five cubic feet per hour. The Gas Works Act provides that the gas supplied shall not be less than sixteen candle-power. The same Act limits the quantity of sulphur in the gas to a certain small amount, and the quality of gas in London in these and other respects is frequently tested in various places by the "gas referees."

Coal Tar. The tar obtained during the manufacture of coal gas (q.v.) is a thick viscid black liquid, which was formerly used only for tarring wood, etc., and was of no commercial value. By distillation, however, it was found a number of products were obtained which were classified as *light*, *intermediate*, and *heavy* oils. The light oil was used as an illuminant, and the heavy or creosote oil was employed for "creosoting" timber to prevent decay. At the present day, however, the coal tar is chiefly valuable as being the primary source of the large class of compounds derived from benzene, and especially of the important and ever-increasing group known as the "coal-tar colours." The first step towards this was the discovery of *benzene* itself in coal tar by Hoffman in 1845, and the preparation in 1856, by Perkin, of *mauveine*, the first aniline dye. Since that time colouring matters of every variety of colour and shade have been added to the list, the most important addition, perhaps, being that of *alizarin* (q.v.), the colour principle of the madder. *Naphthalene* (q.v.) and *anthracene* (q.v.) were also discovered in the previous waste product, and with their derivatives form an important class of commercial substances. The colour industry is not the only one affected by the study of coal tar. To it we owe, among many others, the well-known pharmaceutical preparations *kairine* and *saccharin*, and the photographer is indebted for his isochromatic plates and the developers *hydroquinone* and *eikonogen*. After the distillation of the volatile products from the tar, a black substance, *pitch*, is left behind, used largely for preparation of asphalt, varnishes, patent fuel, etc.

Coalition, by etymology the union of particles to form a new compound, is applied in politics to a temporary union of different parties, in which each party sacrifices some of its own individuality for the sake of better carrying on of the business of the State. Though party government is attended by many evils, coalition has seldom been either permanent or satisfactory.

Coanza, a West African river in the country of Angola. Rising in the Mossamba mountains, and receiving several tributaries, it has a course of about 600 miles to the sea; but owing to falls, is

not navigable for large boats farther than 140 miles from the mouth.

Coatbridge, a town of Lanark in Scotland, about 10 miles E. of Glasgow. It has made great progress of late, and is a municipal borough. The position as the centre of a great mineral district makes it a favoured spot for iron works, the most famed of which are the Gartsherrie works of Messrs. Baird.

Cobalt (symbol Co., at. wt. 58.6), is a reddish-white malleable metal of specific gravity 8.9, which is found naturally, in combination with arsenic and sulphur, as *smaltine* (CoAs_2), and *cobalt glance* (CoAsS). The metal is slightly magnetic, and dissolves slowly in acids. It forms two oxides, the *cobaltous* (CoO) and *cobaltic* (Co_2O_3), which form corresponding series of salts. Of these the *cobaltous chloride* is sometimes used for *sympathetic inks*, as writing in this compound, though invisible when cold, becomes blue on warming. Cobalt compounds are also used for imparting a blue colour to glass and porcelain, and for the manufacture of pigments, as *smalt*, by fusing cobalt ores with quartz and potashes; *Thenard's blue*, by heating the oxide with alumina; *Rinman's green*, in which oxide of zinc takes the place of alumina; and others.

Cobaltite, or COBALTINE ($\text{CoS}_2 + \text{CoAs}$), the arseno-sulphide of cobalt, is a silver-white mineral with a pinkish tarnish, resembling pyrite in crystallising in the cubic system. Heated in the closed tube it is unaltered: in the open tube it gives off sulphurous fumes and a sublimate of arsenious acid. It has a greyish-black streak, and also resembles smaltite (q.v.) in hardness (5.5 to 6) and specific gravity (6.4 to 7.2). It is a valuable ore of cobalt, and occurs at Botallack and St. Austell, in Cornwall; in Sweden, Norway, Westphalia, etc.

Cobbe, FRANCES POWER, born 1822, an English author who wrote voluminously upon subject-theological, scientific, and economical, and practical, besides producing some records of travels. She made some curious and interesting observations upon unconscious cerebration. She also maintained a vigorous crusade against vivisection and its supporters. She died in 1904.

Cobbett, WILLIAM (1762-1835), an English writer of much vigour. Born at Farnham, he began life as a farm labourer, then came to London and became a lawyer's copying clerk. Tired of this, he enlisted, and after seven years' foreign service, where he educated himself by a course of rigid self-denial, he was discharged with the rank of sergeant-major. After going to France and America he came back to England and started first a paper called *The Porcupine*, and then the *Weekly Register*, and for a time he supported the Tory Government. But a prosecution for libel seems to have soured him and turned him into a Radical. After two unsuccessful attempts to get into Parliament he was returned for Oldham in 1832, but lived for too short a time to make any mark. He was a violently

prejudiced partisan, but his writing is agreeable, and there are people who set great store by his *Grammar*, and his *Rural Rides* are interesting for their descriptions. On the whole he is a brilliant example of a self-taught man.

Cobden, RICHARD (1804-1865), the great promoter of free trade, was born at Midhurst in Sussex. Beginning as an apprentice in a warehouse he became a commercial traveller, and in 1830 a partner in a Manchester cotton house. He threw himself actively into life, interesting himself in reform and political economy, and in the advancement of Manchester. In 1838, the year of forming the Anti-Corn Law League, he gave himself heart and soul to its advancement, and entering Parliament in 1841 he saw Sir Robert Peel convinced in 1846, and the Corn Laws doomed. A national subscription was made for him, and in his absence on a continental tour he was elected for West Riding. He was a consistent member of the Peace Society, and his attitude with regard to the Crimean and China wars gained him much unpopularity and cost him his seat. While absent in America he was again returned to Parliament, this time for Rochdale. He refused several offers of place and honours, but successfully negotiated a commercial treaty with France. For some years his health had been precarious, and his last and fatal attack was owing to his eagerness to attend to his parliamentary duties. His death raised a universal feeling of regret at home and abroad. His biography has been written by Mr. John Morley.

Coblenz, a strongly fortified city, upon the tongue of land formed by the junction of the Moselle and Rhine, each of which rivers is crossed by a railway bridge, and by a foot bridge, that over the Moselle being of stone, and that over the Rhine a bridge of boats. The old town is dirty and irregular, but the new town by the Rhine is of a modern character. There are some fine buildings; among them the church of St. Castor, at the extreme point of the tongue of land, which dates from the 12th century, and occupies the site of the oldest Christian church in Rheinland. The Liebfrauenkirche and the old town hall are also interesting. The ancient palace of the Electors of Trèves is now a factory, as is also the archiepiscopal palace. The palace of the 18th century has some fine Gobelin tapestry. Coblenz is the centre of an active wine trade, and exports a vast quantity of mineral waters, and manufactures japanned ware, linens, cottons, and tobacco. Known to the Romans as Confluentes, Coblenz belonged to Trèves almost till the war of the French revolution, when it was made capital of the French department in 1798, and was given to Prussia in 1815. Across the Rhine opposite Coblenz is the famous fortress of Ehrenbreitstein.

Cobra da Capello (Portuguese, *hooded snake*), usually abbreviated to cobra (*Naja tripudians*), a very venomous snake of the family Elapidæ [CORAL SNAKE], from India, and some of the islands of the Eastern Archipelago. There are several varieties, and the length of large specimens is from five feet to six feet, with a maximum girth of

about six inches. The general colour on the upper surface is a uniform brown (which may be light or dark), bluish-white below. These snakes have the power of extending the anterior ribs, and thus dilating the skin of the neck so as to form a kind of hood. In one variety there are dark markings, something like a pair of eye-glasses on the hood, and in another these are reduced to one or more



COBRA DA CAPELLO. (*Naja tripudians*.)

eye-like spots. A cobra, with erected head and dilated hood ready to strike presents a very menacing appearance, but, fortunately, these reptiles are not aggressive, and rarely attack man unless disturbed. Their bite is usually fatal to man, and medical treatment is rarely effectual. Stone heaps, holes in masonry and in the ground, and the roofs of native huts are their favourite haunts, though they climb well, and can swim rapidly. They are most active by night, and feed on mice and rats, birds, and their eggs, small reptiles and insects. The cobra plays an important part in Hindu mythology, and is the serpent usually chosen by charmers for their performances. The Egyptian cobra (*N. haje*) is a closely-allied species [ASP], as is also the Ring Hals snake (*Naja* or *Sepedon hamachates*).

Coburg, in the duchy of Saxe-Coburg-Gotha, and the capital of the duchy of Coburg, is on the left bank of the river Itz, about 80 miles from Eisenach. Among the chief buildings are the 16th-century palace, the arsenal, and the modern palace. On a height is situated the old palace which gave Luther shelter, and was besieged by Wallenstein. It is now a museum. In the market-place is a statue of Prince Albert, who was born a few miles at Coburg. The chief industries of Coburg are the manufacture of lace and the export of beer.

Coca, the careful collector of the most interesting of the only genus of tropical shrubs and trees. The plant is a shrub with alternate, oval leaves, having a smooth surface, and small white flowers. The bark is used for lime or wood-ashes, and other people of the region use it as a nerve stimulant. The roots of large trees are used for sustaining the body against fatigue.

Cocaine, which is obtained from the leaves of the coca plant, is a powerful stimulant and is used in surgery as a local anæsthetic.

of imparting insensibility to pain to parts touched by it. As it further, if applied to the eye, causes also dilation of the pupil, it is especially useful in ophthalmic operations. For these purposes the hydrochloride is the salt generally employed. When employed medicinally it is of importance that the alkaloid should be pure. There are two pharmacopœial preparations, cocaine discs (lamellæ cocainæ), and the liquor cocainæ hydrochloratis.

Cocceius (KOCH) JOHN (1603-1609), a Dutch scholar, and professor of theology at Leyden. He wrote a valuable Lexicon and commentary upon the Old Testament, and he held that the Old Testament was a type of the New, and believed firmly in the Millennium. He published several volumes of theology, and one of his works was published posthumously.

Cocceji, HENRY (1644-1719), a baron of the empire, who, after studying jurisprudence at Leyden, went to England, from which he returned in 1672 to be made professor of law successively at Heidelberg, Utrecht, and Frankfort. His work on Civil Law had much renown.

Cocceji, SAMUEL (1679-1755), son of the above, studied jurisprudence, and was charged with the task of codifying the Prussian Law. In 1727 he was made a minister of State, and in 1746 he became Grand Chancellor of Prussia under Frederick the Great. He edited *Grotius de Jure Belli et Pacis*.

Cocculus Indicus, the dried berry-like fruit of the climbing menispermaceous plant *Anamirta Cocculus*, a native of the East Indies. The seeds contain from one to four per cent. of the acrid irritant poison picrotoxin ($C_{12}H_{14}O_5$), and are used as a black extract in India in some skin diseases and to destroy vermin. Though now discarded from our Pharmacopœia, they are imported to the extent of 50,000 lbs. annually at a price of from seven to nine shillings per cwt., mainly for re-exportation. This substance has been used to poison fish, and is popularly, but probably erroneously, thought to be an adulterant of porter.

Coccygomorphæ, a group of birds in Huxley's classification, containing the cuckoos, kingfishers, goatsuckers, trogons, motmots, rollers, todies, hoopoes, hornbills, toucans, colies, bee-eaters, plantain-eaters, jacamars, and barbets.

Coccyzus. [Cuckoo.]

Cochabamba, a city of Bolivia, capital of department and province, in lat. $17^{\circ} 27' S.$, long. $64^{\circ} 46' W.$, on the banks of the La Rocha, a tributary of the Rio Grande, 122 miles N.W. of Sucre, at a height of 8,370 feet above sea level. The city, which is a bishop's see, was founded in 1565, and was called Orapesa. It has broad streets and its one-storeyed houses are surrounded by gardens. The industries are woollen and cotton manufactures, and the preparation of leather, and making of soap, glass ware and pottery. The population is mostly Indian. The province, which occupies extensive upland plains among the offshoots of the E. Cordilleras, is poor in metals, but has fertile

valleys well fitted for agriculture and cattle-rearing. The climate is equable and healthy, but trade is hampered by want of roads.

Cochimi, a people of Lower California, whose original territory extended from the head of the Gulf of California to Loreto; two divisions, Laymon and Ika; speech quite distinct from all other native languages, though showing some slight affinity with the Yuma of Arizona. The Cochimi formerly roamed the northern plains now occupied by the Bocopas, by whom they were gradually driven west of the Colorado. They are a restless nomad people, continually shifting their camping grounds, seeking the shelter of rocks or brushwood, but building no habitations of any kind except, perhaps, a few dens or lairs for their sick. Formerly they even dispensed with all clothing, though fond of ornaments such as shell necklaces, bracelets, and feathery head-dresses. They are dying out.

Cochin. 1. A native state of India in the presidency of Madras, between lat. $9^{\circ} 48'$ and $10^{\circ} 50' N.$, and long. $76^{\circ} 5'$ and $76^{\circ} 58' E.$, having South Malabar and Coimbatore on the N.E. and W., the Indian Ocean on the W., and Travancore on the S. The state has an area of 1,361 square miles, and is divided into seven districts. Hemmed in between the sea and the Western Ghats, it is well watered by numerous rivers which form lagoons and backwaters, which alternate between wide navigable sheets in the wet season—from June to December—and scattered shallows in the dry season. Rice is extensively grown, and there are remains of fine teak forests, which produce a considerable quantity of timber. Among other productions the chief are coffee, cotton, pepper, ginger, and spices. Besides the British port of Cochin, there are the trading ports of Malipuram and Narakel, the latter of which forms a port of shelter during the monsoons, where the British India Company's steamers touch during several months of the year instead of at Cochin.

2. A town of British India, on the South Malabar coast, at the north of a strip of land twelve miles long by an average of one mile broad, almost cut off from the mainland by inlets of the sea and backwaters of the river estuaries. In 1663 the Dutch captured it from the Portuguese and made it a very prosperous town; the English captured it in 1796 and the trade considerably declined. A bar obstructs the entry of the river, and renders it unsafe of approach during the monsoons. A light-house, visible at fifteen miles, marks the south entrance of the harbour. For ship-building and commerce Cochin ranks next after Bombay.

Cochin China, the eastern division of the Indo-Chinese peninsula, includes Anam proper, the French colony of Cochin China and Tong-King, and consists of a strip of land forming the arc of a circle, and extending about 1,240 miles along the coast, being bounded on the W. by a mountain chain, and varying in breadth from 372 miles in the N. of Tong-King to 50 miles in Hué and 190 miles in Lower Cochin China. The empire of Anam contains about 230,000 square miles, and the French Indo-China about 21,630, but the western

boundary is vague, and many parts are unexplored. The country in the S. is low, flat, and alluvial, rising, however, to the height of 920 feet in Cape St. Jacques, at the entrance of the river Donnai, which leads to Saigon. The principal river of this part of the country is the Cambodia or Me-Kong, which has a delta of more than seventy miles in area. About 45 miles from the mouth of the Me-Kong is the island of Pulo Condore, with a good port, and a French penitentiary establishment, and the coast generally is studded with islands, some of which in the Gulf of Tong-King are the haunts of pirates. The chain of mountains which stretches for a long way down the west of the country is the last offshoot of the plateau of Thibet, but nowhere rises to a greater height than 5,250 feet. The principal river of Tong-King is the Hong-Kiang, upon which the capital Hanoi is situated. This river is very low in March, but becomes a torrent in July, and floods the country. The kingdom of Anam has many unimportant rivers, and most of the rivers of Southern Cochin China are connected by canals. The climate of Tong-King is healthy, but that of the French colony is particularly fatal to Europeans, dysentery being the most prevalent disease. The mean temperature of this part is $83^{\circ} F.$, and the atmosphere is damp and depressing. The fauna is rich, and besides the timber forests, there are in parts abundant fruit-trees, from which one province—Vinhlong—obtains its name of the garden. The chief production is rice, next to which come cotton, mulberry, sugar-cane, maize, betel, and vegetables, and the cultivation of tea has been introduced. Tong-King is rich in metals, but Lower Cochin China is poor in minerals. The population of nearly two millions consists chiefly of Anamites, who present peculiarities which mark them off as a distinct race, Cambodians, Chinese, savages, and Malays. The French colony is connected by telegraph with Singapore, Tong-King, and Hong-Kong, and Saigon has a railway and steam tramways.

Cochin Chinese, the northern branch of the Annamese nation [ANAM], who at present occupy the region formerly held by the Chams. [CHAMS.]

Cochlea. [EAR.]

Cochrane, THE HON. SIR ALEXANDER FORESTER INGLIS, British naval officer, son of Thomas, Earl of Dundonald, was born in 1758, and, having entered the royal navy, was signal lieutenant to Sir G. B. Rodney in the action with M. de Guichen in 1780, and was on that occasion wounded. As captain of the *Thetis*, 42, he took part in 1795 in a very gallant and successful action with five French vessels; and as captain of the *Ajax*, 80, he accompanied, in 1800, the expeditions against Quiberon, Belleisle, and Ferrol, and shared in the subsequent debarkation of the army in Egypt. In 1802 he entered Parliament for the Stirling Burghs, but upon the renewal of the war in 1803 he returned to active service, and in 1804 became rear-admiral. From 1805 to 1810 he commanded-in-chief on the Leeward Islands station, participating in Sir John Duckworth's complete victory off St. Domingo and

in the reduction of St. Thomas, St. John, St. Croix, Martinique, and Guadeloupe. He had, in 1809, become a vice-admiral. In 1813 he was made commander-in-chief in North America, where, by forces under his orders, the coast was blockaded and Washington was destroyed. He came home in 1815, was promoted to be admiral in 1819, was port-admiral at Plymouth from 1821 to 1824, and died in 1832, being at the time a G.C.B.

Cochrane, THOMAS, LORD COCHRANE. [DUN-
DONALD.]

Cochrane, SIR THOMAS JOHN, eldest son of Admiral the Hon. Sir A. F. I. Cochrane, was born in 1789, entered the royal navy in 1796, and became a lieutenant in 1805, and a commander and captain in 1806, being then only seventeen. In the *Jason*, 32, he, in 1807, captured the *Favorite*, 29, and assisted in the reduction of the Danish West India islands. During the war of 1812 he served under his father with much distinction. Attaining the rank of rear-admiral in 1841, he became, in 1842, second in command in the East Indies, and in 1845 succeeded Sir William Parker as senior officer there. He during that period rendered to his country valuable services against the Borneo pirates. In 1850 he was made a vice-admiral, and in 1852 became port-admiral at Portsmouth. In 1856 he reached the rank of admiral; and at his death, in 1872, he was a G.C.B. and senior admiral of the fleet. Sir Thomas, who had been knighted in 1812, was, in 1839, returned to Parliament for the borough of Ipswich.

Cockade, which would be more correctly written *cocarde*, denotes a badge, generally worn in the hat, to show the wearer's political or other views. The custom which is now so general of affixing a cockade to the hats of menservants is really no older than the present dynasty, and the cockade as now worn, which is known as the "black cockade of Hanover," signifies allegiance to the House of Hanover as such, though not necessarily as sovereigns of England. The cockade is purely a naval and military badge, and is only worn by the servants of the royal navy, or royal naval reserve, of counties, and of the city of London; and it is a great point of distinction between the mark of distinction of the naval cockade, and that of the civilians. The plain white cockade, and that rising above the cockade in "the day badge of allegiance," the use of coloured subjects of

Cockade, a badge worn in the hat, for
Catopside, a badge worn in the hat, for
cockade, a badge worn in the hat, for

Cockat, a popular name for the bird,
a popular name for the bird,
are distinguished by the colour of the
the colour of the bird,
family name

Australian region, especially in its Austro-Malayan portion, but are not found farther east than the Solomon Islands, and are absent from New Zealand. The type-genus *Cacatua*, with eighteen species, ranges from the Philippines southward to Tasmania; *Calyptorhynchus* is confined to Australia and Tasmania; and *Microglossus* to North Australia and the Papuan district. The plumage of the last two genera is black. [COCKATIEL, PARROT.]

Cockatrice. This creature, which, of course, is entirely imaginary, is depicted in heraldry as having the beak, head, comb, wattles, and legs of any ordinary cock, and the body, the wings, and the tail of a wyvern, i.e. its body is elongated and curled round, gradually diminishing in breadth until it ends in the barbed tail of the dragon. The wings are exactly as those of this latter animal, and are always shown to be elevated, whilst occasionally they are also expanded one on each side.

Cockburn, SIR ALEXANDER (1802-1880), an English judge, was educated at Cambridge, and called to the bar in 1829. He soon obtained a good parliamentary practice, and in 1847 became Liberal member for Southampton. In 1850 he became Solicitor-General and was knighted; in 1856 he was made Chief Justice of the Common Pleas, and in 1859 Lord Chief Justice. As an advocate Sir Alexander was renowned for his eloquence, and was an acute and painstaking judge. His prosecution of Palmer—in which case he was opposed to Mr. Shee—will still be in the minds of some, as well as his connection with the Tichborne and Wainwright trials. He represented England at the Geneva Conference arising out of the Alabama case.

Cockburn, MRS. ALISON (1713-1795), a Scottish woman of letters, chiefly known as the writer of *The Flowers of the Forest* (1765). She was the daughter of Robert Rutherford, and in 1731 married an advocate, becoming a widow in 1753. She was a queen of Edinburgh society, and in 1777 foresaw the greatness of Scott, whose mother was her relative. In 1786 she made the acquaintance of Burns.

Cockburn, SIR GEORGE, British naval officer, born in London in 1772, entered the service in 1781, and, after his promotion to post-rank in 1794, greatly distinguished himself as captain of the *Meleager*, 32, *Minerva*, 42, *Phaeton*, 38, *Captain*, 74, and *Pompée*, 74, in each of which he was several times engaged, and made numerous prizes. In the last-named ship he, with a commodore's broad pennant flying, captured Martinique in 1809. He next commanded a division of small craft during the operations in the Scheldt, and subsequently a small expedition fitted out for the liberation and assistance of Ferdinand VII. of Spain. After much service he was, in 1812, made a rear-admiral, and hoisted his flag in the *Marlborough*, 74, as commander of the squadron destined for the defence of Cadiz; but, the siege having been raised before his arrival, he was ordered to North America. He reached the Chesapeake in March, 1813, and began

a desultory system of warfare, which, if it led to no great results, was exceedingly brilliant, and very harassing to the enemy. Both in the Potomac and in the Patuxent he carried everything before him. He co-operated with General Ross in the operations which led to the capture of Washington; he landed and took part in the profitless descent on Baltimore; he occupied St. Mary's; and so good a reputation did he create for himself that, upon his return to England, no one was deemed fitter than he to carry Napoleon to St. Helena, and to guard him there upon his arrival. In the *Northumberland*, 74, he sailed from Plymouth on August 8th, 1815, and on October 15th following he landed the Emperor upon his island prison. In the following year he was superseded and came home, and in 1819 he became a vice-admiral. From 1832 to 1836 he commanded on the North America and West India station; in 1837 he became an admiral; from 1841 to 1846 he was a Lord of the Admiralty; in 1851 he was made admiral of the fleet; in 1852 he was invested with a baronetcy; and in 1853 he died. He had been nominated a G.C.B. in 1818, elected a F.R.S. in 1820, and, with brief intermissions, he sat in Parliament for various constituencies from 1818 until nearly the close of his career. In 1827 he became a privy councillor.

Cockburn, HENRY (1779-1854), a Scottish judge, and man of letters, was born at Edinburgh, and educated at the High School and university of that town, and belonged to the debating society of which Scott, Brougham, and Jeffrey were members. He was called to the bar in 1800, and joined the Whig party, though all his surroundings were Tory. In 1830—with the accession of Earl Grey to power—he became Solicitor-General for Scotland, and four years later took his seat in the Court of Session as Lord Cockburn. In 1837 he was appointed Lord of Justiciary. His style of eloquence was clear, pathetic, and simple, and he was renowned for his powers of conversation. He was a considerable writer. The *Life of Lord Jeffrey* (1852), and the *Memorials of his Time* (1856), display great literary ability. He also wrote several pamphlets, and was an important contributor to the *Edinburgh Review*.

Cocker. [SPANIEL.]

Cocker, EDWARD (1631-1675), an engraver who taught writing and arithmetic, and was the author of the celebrated arithmetic, which gave rise to the expression "according to Cocker." This book has been condemned as a bad one which led to great deterioration among elementary books on the subject, and has been declared also to be a forgery, and not the work of Cocker at all. The same is said also of his English Dictionary. Pepys speaks of him in his diary as well-read in the poets.

Cockermouth, parliamentary borough and market town of Cumberland, 25 miles from Carlisle, and situate at the junction of the Cocker and the Derwent. There are coal mines in the neighbourhood, and linen and woollen goods, threads, hosiery, hats, and paper, are manufactured. In the

eleventh-century castle Mary Stuart was imprisoned in 1568, and in 1648 the castle was dismantled by the Parliamentary forces. In the neighbourhood tumuli have been discovered, and remains of a Roman camp. The town returns one member to Parliament. Wordsworth was born here. Pop. (1901), 5,355.

Cock-fighting is an ancient British sport, now almost obsolete owing to legal enactments and the change of taste. The sport is to be met with as early as the time of Edward III., and remained popular for centuries, and gave rise to a special breed of birds, whose natural pugnacity was increased by selection and feeding. Few people now understand what it is to fight a main of cocks, or know what are the distinguishing features of a Welsh main; nor is the knowledge of these points of any great consequence. The Malays are passionately fond of cock-fighting.

Cock-lane Ghost, a story of a ghost which has had a false importance given to it by reason of being mixed up with Dr. Johnson. A certain man and his daughter occupied a house in Smithfield, in which the wife of a former tenant had died. Mysterious knockings were heard—afterwards discovered to have been produced by the daughter aforesaid—which declared in a manner well known to ghost hunters that the former tenant had murdered his wife, and this unfortunate man was much persecuted in consequence. Whether Dr. Johnson did or did not believe the story is of no consequence, especially as no one reads Churchill's clumsy satire upon him.

Cockle, an interesting name commonly applied to the caryophyllaceous cornfield weed *Agrostemma Githago*. In the Saxon version of St. Matthew's Gospel it occurs as "coccel," and in the Douai version as "cockle," where the Authorised Version has "tares." The word, which is also used by Chaucer and Spenser, does not occur in cognate Teutonic dialects; but there is a Gaelic form "cogall," and an etymological connection has been suggested with the British word "coch," red, in allusion to the pretty rose-red flower. De Candolle, however, considers the plant to have been unknown to the ancients in southern or western Europe, and, pointing out its abundantly spontaneous growth in Northern Russia and the name in Russian "kukael," and in Polish "kakol," as the source of the modern Greek "kökkölē," suggests a Slav origin for both plant and name. On these grounds its possible accidental introduction in the earliest days of our Russian commerce, under Alfred, has been suggested.

Cockle, a mollusc of the genus *Cardium*, and family *Cardiidae*. The most common species, *C. edule*, is the familiar edible cockle.

Cockney, from a word originally meaning an egg, then perhaps a small egg (still popularly termed a cock's egg); hence the term came to be applied to a weak, squeamish child; from this arose the term "King of Cockneys" confused with King of Cockaigne, or London. Henry III. was alluded to as the King of Cockneie. Later it was

applied to Londoners born, that is, if they were born within the sound of Bow bells in Cheapside, and later still as an adjective to any distinct London peculiarity. But in these days of universal travelling and shifting populations the word carries no clear meaning.

Cockpit, the sunk arena in which cocks were "pitted" against each other. It is also used as the name of the part of a ship in which some of the junior officers lived, and whither in an engagement the wounded were carried to be dealt with by the surgeons. In Shakespeare's *Henry V.* the theatre is spoken of as a cockpit.

Cock of the Plains (*Centrocercus urophasianus*), a large American grouse, called also the Sage Cock from the fact that it feeds on *Artemisia* (wild sage), which gives a bitter flavour to the flesh.

Cock of the Rock, any bird of the South American passerine genus *Rupicola*, distinguished by an elevated crest extending from the neck forward so as to cover the nostrils. In the best known species (*R. crocea*), about the size of a pigeon, the plumage is of a brilliant orange-yellow in the adult male; that of females and immature males is dull yellowish-green, and in these birds the crest is smaller.

Cock of the Woods. [CAPERCAILZIE.]

Cocoa-nut, now often spelt **COKEE-NUT** so as to avoid confusion with the seeds of the cacao (q.v.), is the "nut" or hard interior of the fruit (endocarp) of *Cocos nucifera*, the type of a small genus of palms. The cocoa-nut palm is apparently a native of the Indian Archipelago, but has been dispersed throughout the tropics from early times, flourishing especially near the sea. It has a cylindric stem reaching two feet in diameter, and from 60 to 100 feet in height; a crown of pinnate leaves, each 18 to 20 feet long, with a sheathing and fibrous base, and branching numerous spadices 5 or 6 feet long in terminal spikes succeeded by bunches of from ten to twenty flowers. These are about a foot long, sessile, and three-lobed, with a membranous pericarp, stony shell or endocarp, and a fleshy perisperm, and a minute seed. The tree of the tropics has been long known and being employed, and several of the chief uses of the outer part of the nut, under the name of *Porcupine* (q.v.), are for thatch, mats, hats, etc.; the shell for charcoal, etc.; when pressed, affords an excellent lamp-black; the oil is used for which it is famous, and contains a white kernel from which it is pressed for The "milk" is obtained and, from the seed, and, by fermentation, and, by distillation, yields coconut oil

is an important article of commerce, being much employed in Europe for various purposes. About a quart, it is said, may be obtained from eight cocoa-nuts.

Coco-de-mer, or DOUBLE COCOA-NUT, the remarkable fruit of *Lodoicea sechellarum*, a palm restricted to the islands of Praslin and Curieuse in the Seychelles. The fruit was known as flotsam in the Maldivé Islands, before the discovery in 1734 of the Seychelles, and was supposed to be of marine origin. It contains one, two or three bi-lobed nuts, with hard black shells like double cocoa-nuts, and weighs about 40 lbs.

Coconada, in the Madras presidency, about 300 miles from Madras, is a sea-port of the Godavari district, and has an export trade in cotton, cigars, sugar, rice, and oil seeds.

Cod (*Gadus morrhua*), a well-known and valuable food-fish, type of the genus *Gadus*, from the Arctic and north temperate zones, containing eighteen species, having the body moderately elongated and covered with small scales; they have three dorsals, a separate caudal and two anal fins, and the ventrals, composed of at least six rays, are narrow; there are teeth on the upper jaw and vomer, but none on the palatine bones. To this genus also belong the bib, coal-fish, haddock, pollack, tom-cod, and whiting (all which see). The name is often extended to the whole anacanthinous family Gadidæ, in which the burbot, hake, ling, and torsk, also important food-fish, are comprised. The common cod-fish is from 2 feet to 4 feet in length, and sometimes attains a weight of 100 pounds, but specimens of from 60 to 70 pounds, with a length of about 3 feet, are much more common. Fish from the British coasts and North Sea are olive-brown above, with yellowish spots, and whitish beneath, and with dusky fins; farther north the hue becomes darker, and in fish from the Arctic coasts there is generally a dark blotch on the side. They are very voracious, and feed on worms, crustaceans, and small fishes. They are exceedingly prolific, and spawn in January round the British coasts, but much later on those of America. Cod-fishing has been systematically carried on for some three centuries on the banks of Newfoundland, and most of the preserved cod is of American production. The Dogger Bank is also a well-known fishing ground, and the cod-fishing industry is an important one on British coasts and on those of Iceland, Sweden, and Norway. The smoked roe and the sound, when salted, are esteemed as delicacies; the latter dried is sometimes used as a substitute for isinglass. [COD LIVER OIL.]

Cod Liver Oil, a valuable remedy in most forms of chronic disease in which wasting is a prominent symptom, and as a tonic during convalescence from acute disease. It is a particularly favourite remedy in all lung diseases attended by loss of flesh, in chronic rheumatism, and in scrofula. It is no use giving cod liver oil if it cannot be digested, and although it is more readily absorbed than other fats and oils are, it must fail to be of service where high fever is present. Again, the existence of diarrhoea is a contra-indication to its use.

Code (Lat. *codex*), a systematised collection of regulations or laws drawn up for convenience of reference, as, for example, a code of signals. The word is specially used to signify a condensed body of laws or procedure. The most famous codes have been those of Theodosius, Justinian, and Napoleon, the last of which is the basis of many modern legal systems, while the former two much modified the civil law, and through it the English, and especially the Scottish systems. No real effort has yet been made to codify English law. Austin seemed likely to be able to inaugurate one, but, besides the fact that he was a doctrinaire, his health prevented his attempting more than an outline of the way in which it should be done. So England remains almost alone among nations in having no code. Lord Macaulay and Sir James Fitzjames Stephen digested and codified the laws of our Indian Empire.

Codex (Lat. *a set of wooden tablets*, hence a book) is a term applied to any MS., but especially to any of the authentic MSS. of the Christian Gospels, which have been discovered in divers places and at various times. These discoveries have thrown valuable light on many critical points, and are of great interest to Biblical students. In France the Codex signifies an authorised body of medical formulæ.

Codicil (derived from the Latin word *codicillus*, *a little book or writing*) is an instrument made by a testator subsequently to his will, to which it is ancillary, and by which the dispositions contained in the will may be modified, cancelled, or otherwise altered. It is subject to the same rules as to execution and attestation as the will itself, of which it is considered to be a part, and the law regarding wills is in all respects the same as that affecting codicils. [WILLS.]

Codrington, SIR EDWARD, British naval commander, was born in 1770, and entered the royal navy in 1783 on board the yacht *Augusta*. Until promoted to be lieutenant in 1793, he served successively in North America, the Mediterranean, and the Channel. Subsequently he joined the *Queen Charlotte*, flagship of Earl Howe, and in her participated in the action of the Glorious First of June, 1794. In the following October he was made a commander, and in 1795 was posted to the *Babet*, 22, in which he was present at Lord Bridport's action off Ile de Groix. He was captain of the *Orion*, 74, at Trafalgar, and received, in consequence, the gold medal. In 1808 he was appointed to the *Blake*, 74, and in her served with the unfortunate expedition against Walcheren with great distinction, especially on the occasion of the forcing of the passage of the Scheldt. In the same vessel he rendered valuable assistance against the French in Spain, and, landing, did also good work ashore. He returned home in 1813, and was made a colonel of marines. Sailing soon afterwards for North America with a commodore's pennant in the *Forth*, 40, he was, in the summer of 1814, promoted to the rank of rear-admiral, and appointed captain of the fleet to Sir Alexander Cochrane in the *Pennant*, 80. He was present at the capture and

destruction of Washington, and then, hoisting his flag in the *Havannah*, 36, took part in the operations against New Orleans. In 1815 he was made a K.C.B., in 1821 vice-admiral, and in 1826 commander-in-chief in the Mediterranean, with his flag in the *Asia*, 84. He was the senior officer of the combined British, French, and Russian squadron which, on October 20, 1827, destroyed the Turco-Egyptian fleet in the Bay of Navarino. As a reward he was made a G.C.B., but he would undoubtedly have received from King George far higher honour had there been in England more unanimity than existed as to the wisdom of the policy which he had been deputed to carry out. From foreign sovereigns he received the orders of St. Louis of France, St. George of Russia, and the Redeemer of Greece, but he was recalled in 1828. In 1831 he commanded a squadron of observation in the Channel, and having in 1837 reached the rank of admiral, was, in 1839, appointed commander-in-chief at Portsmouth. He relinquished this post in 1842, and never again hoisted his flag. Sir Edward, who was a G.C.M.G. and F.R.S., represented Devonport in Parliament from 1832 to 1840. By his wife, *née* Miss Jane Hall, he had, with other children, a son Henry John, who, after taking part in the attack on St. Jean d'Acre in 1840, also became an admiral, and died in 1877, at the age of 69, and a daughter, who married Sir Thomas Bourchier, R.N., and wrote her distinguished father's biography. Sir Edward, who was one of the last survivors of the Trafalgar captains, died in 1851.

Codrington, GENERAL SIR WILLIAM, son of Sir Edward (1804–1884), was commander-in-chief in the Crimea in 1855.

Codrus (11th century B.C.) was the last king of Athens. He was the son of Melanthus, and sacrificed his life for his country in a war between the Athenians and Dorians. An oracle had declared—unlike the oracle in Scott's *Lady of the Lake*—that the blood of the Athenian king would ensure victory to his side. So Codrus entered the Dorian camp disguised, and was slain in a quarrel with some of the enemy's soldiers. The title of king was abolished by the Athenians, who thought no one fit to hold it after him.

Coefficient, in *Algebra*, is the factor in a term by which the unknown quantity is multiplied. Thus in the terms $3x$, ax , the coefficients are 3 and a . The term *differential coefficient* is applied in the higher calculus to represent the rate of change of one quantity with regard to another on which it depends. [CALCULUS.] In physics the term is frequently used. The coefficient of linear expansion of a substance for temperature means the amount of expansion that unit length of the substance undergoes when its temperature increases from 0° to 1° C. Similarly for expansion of areas and volumes. In electrical engineering the temperature coefficient of a metal is the proportional increase in its resistance per degree rise in temperature.

Coehoorn, MENNO, BARON VAN, called the Dutch Vauban, was a military engineer, born in 1641, near Leeuwarden, the son of a captain of infantry. He

studied fortification at Franeker, and at the age of sixteen was already a captain. He distinguished himself upon many occasions, especially at the siege of Maestricht, and in 1673 he made use of the mortars which he had invented and which were called after him. Readers of *Roderick Random* will remember that these mortars formed part of the armament of one of the ships that Roderick was on board of. In 1692 he fortified Namur, and afterwards defended it against Vauban. In 1695 he retook the town. In 1701 he besieged and took many towns during the war of the Spanish succession, and finally died in 1704 at the Hague, where he had gone to consult with Marlborough upon the next campaign.

Coeliac Axis. An important branch of the great arterial trunk called the abdominal aorta. [AORTA.] It divides into three branches, which are severally concerned in supplying with blood the stomach, liver, and spleen.

Cœlome. [BODY CAVITY.]

Coercive Force, the older expression for magnetic resistance (q.v.). The terms magnetic reluctance, molecular rigidity, and magnetic inertia are also variously employed to express the same state—that of the resistance to magnetisation that iron exhibits when placed in a magnetic field, and its subsequent resistance to part with its magnetism when removed from the field. [MAGNETISM.]

Coffee, named from Caffa, one of the provinces of Abyssinia, of which the original coffee-shrub is a native, is the horny seed of shrubs belonging to the rubiaceous genus *Coffea*. They are shrubs or small trees of the tropics, with opposite glossy leaves, small sessile white flowers, and berry-like bi-carpellate fruits, resembling red cherries. The pulp and a parchment-like covering having been removed, the seeds or "beans," of which there are two in each fruit, are roasted, in which process a fragrant oil is produced. The coffee was introduced from Abyssinia into Europe in the fifteenth century by the Portuguese. About the middle of the sixteenth century it became general. In the middle of the sixteenth century it was cultivated in a house in London where it is now cultivated. It now receives more from other countries. It appears to be diminishing in the use of cheapness, due to the ravages of the coffee-borer (*Antrenia coffea*) in the coffee plantations of West India. It has extensive effects owing to which it is identified in the leaves of the infusoria.

and parsnips are among the common cheap adulterants of ground coffee. Imitation coffee-beans are manufactured from compressed meal in the United States, and a company was floated in England a few years ago for the preparation of coffee from date-stones.

Coffee-house now generally signifies a house of refreshment, where food is supplied, but no fermented or spirituous liquors. In the 18th century the coffee-house occupied much of the position now taken up by social clubs, and was the resort of poets, wits, and politicians, who went to drink their coffee and smoke their churchwarden. The Continental café seems to be difficult to introduce among us.

Coffer-dam, a casing of timber or iron fixed round the foundations of bridge-piers, sea and river walls, etc., during their construction, from the interior of which the water is removed, so that operations may go on below the water-level outside. It may be made of a double ring of wooden piers driven in side by side, the space between the two rows being filled up with clay or other impervious material. To resist the outside pressure of water, the interior of the coffer-dam is strongly stayed, and the piers are themselves well counter-braced. Stone may be used instead of timber, but sheet-iron casing is the more frequently employed. Wrought-iron caissons (q.v.) placed side by side, the joints between them being well caulked with felt or other such material, form a serviceable arrangement. The term is also applied to a watertight compartment built into the side of a warship, and filled with some water-excluding material, so that, if projectiles enter the vessel, very little water follows through the aperture.

Coffer-fish, any individual of the Plectognathous genus *Ostracion*, with twenty-two species from tropical and sub-tropical seas. The body is enclosed in a kind of box made up of six-sided bony plates, and having openings for the fins and tail. [GLOBE-FISH.]

Coffin (Gk. *kophinos*, a coffer or basket) is now generally used to denote the box in which the dead are enclosed for burial, and is in America called a casket. The form used generally in England is familiar to all. The coffin with raised roof, which one often sees abroad, is rarely met with in England. Though wood is the material generally employed, stone and metal have also been used, and there are many modern patents. Some are as eager as others are reluctant to return their bodies to mother earth; but even the stone coffin is at last taken from its occupant, and becomes the possession of an antiquary or of a museum. The name was also applied in old English to pie-crust; and in anatomy it denotes part of a horse's hoof.

Cognac, a French town, head of arrondissement in the department of Charente, on the left bank of the Charente, 32 miles W. of Angoulême, and 42 miles S.E. of Rochefort. There is an old castle upon a rocky height over the river, and a bronze statue of Francis I. marks his birthplace.

The district is chiefly noted for its vines and the manufacture of brandy, the distillation of which, together with the making of casks and bottles, is the chief industry of the town.

Cognovit, or "cognovit actionem," is the term applied to the document by which a defendant, on being sued, confesses the plaintiff's debt and suffers judgment to be entered against him. It is often adopted as a form of security for money, the course being for the debtor to execute a warrant to some solicitor named by the creditor, empowering him to enter judgment against the debtor in an action for a specific sum. It is subject to restrictive regulations, the most important being that it must be explained to the debtor by a solicitor specially appointed by him, who must attest his signature to the document.

Cogswell, JOSEPH GREEN, D.D. (1786-1871), an American bibliographer, born in Massachusetts, and educated at Harvard and Göttingen. He was professor of geology at Harvard (1820-23), and edited for a time the *New York Review*, and helped Halleck and Washington to plan the Astor Library, which he superintended for many years.

Cohesion, (1) the tendency for closely united particles to resist separation. The forces that keep the molecules of a body close together only act through very small distances. That is to say, if two particles are to exert a cohesive force on each other, their distance apart must be exceedingly small. Cohesion may be well observed in a soap film, or in a drop of water hanging from a glass rod. In the latter case we have the weight of the drop supported by a small area of water-particles. The term *adhesion* is similarly applied to the tendency for particles of different kinds to resist separation when once they are brought into close contact; it is instanced by the attraction between the water-particles and glass rod, in the case of the pendant drop previously mentioned.

(2) In *Botany*, cohesion means the union of similar organs, e.g. sepals to sepals, stamens to stamens, etc. In the flower apparent cohesion of the sepals, petals, filaments, or carpels is generally due to the intercalary growth of a zone of tissue below the whorl of organs which appear to cohere, carrying them up with it, and forming the so-called calyx-tube, corolla-tube, staminal-tube, or syncarous ovary. The united (syngenesious) anthers of *Compositæ* are a case of true cohesion of originally distinct structures.

Cohoes, a manufacturing town in Albany Co., New York, on the Hudson, at the mouth of the Mohawk, and on the Erie Canal. It has cotton and nitro-mills, and produces machinery, pins, and bread, among other things.

Cohort (Lat. *cohors*), in the Roman army, the sixth part of a legion. It then came to be applied generally to any body of soldiers consisting of the same arm, and might contain from 300 to 600 men. The word is used metaphorically—chiefly in poetry—and Byron tells us of the Assyrians' cohorts gleaming in purple and gold.

Coif (perhaps Ger. *kopf*), a covering for the head, sometimes a close cap used for the protection of the head from the weather, sometimes to prevent the chafing of a helmet or other head-mail. It became part of legal head-dress, especially of sergeants-at-law, whose degree was sometimes called that of the coif. After the disuse of the coif proper and the adoption of the wig, a patch upon the top of the wig preserved the memory of the coif. The word also denotes a cap worn by elderly females in Scotland.



COIF.

Coils, INDUCTION. [INDUCTION.]

Coils, RESISTANCE. [RESISTANCE.]

Coimbatore, capital of a district in the Madras Presidency, on the Noyil, and 304 miles S.W. of Madras. It is a well-built and well-drained town, at a height of 1,437 ft. above the sea, and has a cool climate well suited to Europeans. The whole district of 7,432 sq. miles bears the same name as the capital, and produces cotton and tobacco, as well as timber from extensive teak forests.

Coimbra, a Portuguese city, capital of the province of Beira, situated on rising ground on the north bank of the Mondego, about 120 miles S.W. of Lisbon. The streets are steep, narrow, and dirty, and its chief products are earthenware and combs. It is of historical interest as being almost on the site of a Roman town, and was held by Goths and Moors successively, being finally taken from the latter by Fernando and the Cid in 1064. It was formerly the capital of Portugal. There are two cathedrals, a church of San Salvador, and a ruined convent. On the opposite side of the river is the Quinta das Lagrimas—or House of Tears—where Inez de Castro is said to have been murdered. Coimbra contains the only Portuguese university, removed from Lisbon in 1537, which has five faculties, with museum, observatory, botanic garden, and library.

Coina, a Spanish town in the province of Malaga, and 20 miles from the town of that name. It has an episcopal palace and two large churches, and there are marble quarries in the neighbourhood.

Coining, the stamping of metal with certain marks, giving it an ascertained current value. It is in most states the prerogative of the sovereign who (as the arbiter of domestic commerce) gives the authority which makes the coin current. By a statute of Victoria's reign (24 and 25 Vic., c. 99) it is made a felony to counterfeit coin, to colour or gild, so as to make a resemblance to gold or silver coin, to impair or lighten coin, to have in unlawful possession filings or chippings produced by impairing or lightening coin, to buy or sell, or import or utter counterfeit coin. There are numerous other provisions in the above Act for the suppression of the manufacturing, importing, and uttering counterfeit coin. By another Act, also of Victoria's reign

not only to obtain rich rewards and appointments for himself and his family, but also to gain the confidence of Mazarin, who entrusted him with affairs of great moment. Colbert was already forming his ideas of financial reform, and drew up a memorial to Mazarin, setting forth the fact that only a small proportion of the taxes reached the king, and drawing attention to the extortions of the superintendent Fouquet, who was his own nominee. Fouquet discovered Colbert's action, and became his bitter enemy in consequence. Upon the death of Mazarin in 1661 Colbert came into great prominence, and in nine years was supreme in all but war. His first idea was to bring about a financial and fiscal reform as the first step to restoring the country's greatness, and in this he was seconded by the young king, Louis XIV. The first step was to arrest Fouquet, who was banished; the next to punish the defaulting officers and fraudulent creditors of the State, and to vest the control of finances in a royal council with the king as president, but of which Colbert was the moving spirit. He introduced many reforms in taxation, protected industry and encouraged inventors, and gave a great impetus to foreign trade. His elaborate regulation of processes of manufacture, however, was much resented by the commercial world, and his policy stimulated that "individualist" reaction against government interference which is seen in the economic literature, French and English, of the last century. But his greatest achievement was to establish the French marine both of war and of commerce, and he was not very scrupulous as to the means he employed to bring about his ends. He also did much to advance art, literature, and science, and as superintendent of public buildings did much to improve and beautify Paris. He did not, meantime, neglect his own interests, and he died a millionaire. But all his efforts were neutralised by the vast demands for money to carry on the king's wars, and a few years after relieving the country of some of its taxes, he was obliged to heap on more; and the king's favour for his great rival, Louvois, is said to have had much to do with bringing him to a comparatively early death.

Colburn, ZERAH (1804-1840), a young American of Vermont, who at the age of six displayed such powers as a calculating boy that his father exhibited him in America, Great Britain, and France. He was put to school at Westminster, and after his father's death in 1824 he returned to America, where he was a Methodist preacher for nine years. He was appointed professor of languages in Norwich University, Vermont, in 1835.

Colchester, a municipal and parliamentary borough of Essex, on the right bank of the Colne, 12 miles from the sea and 51 miles from London. Three bridges cross the river. The town forms an oblong upon the ridge and sides of a promontory, called the Hythe, which stretches down to the river and forms the port. Colchester owes much of its importance to the fact of its being the natural port and outlet of a great corn-growing district, and to its oyster fishery which has belonged to the corporation from the time of the Norman conquest,

if not longer, though the fishery is not now so important as formerly. There was formerly much manufacture of baize and serge, an industry introduced by the Dutch refugees, but this trade has died out, its place having partly been taken by the manufacture of silk. Colchester is a town of much historic interest. It was the British town of King Cunobelin, and then the Roman colony, Camulodunum. Roman remains are abundant in the neighbourhood, and some of the walls date from this period. It was also an important place in the Middle Ages. In Edward III.'s reign it provided five ships and 140 sailors for the siege of Calais. It was besieged and captured by Fairfax in 1648, and the castle was dismantled. The castle keep is the largest example of Norman architecture of the kind existing in England. Pop. (1801), 38,351.

Colchester, CHARLES ABBOT, LORD (1757-1829), an English member of Parliament and Speaker of the House of Commons. He was the son of the rector of Colchester and half-brother of Jeremy Bentham. He was educated at Westminster and Christ Church, and he gained at Oxford the Chancellor's medal and the Vinerian scholarship. He practised at the bar for a few years, and in 1795 received a post in the King's Bench. In the same year he was returned to Parliament for Helston. He soon became noted as a parliamentary reformer, and was the chief cause of the taking of the first census in 1801. In that year he became Chief Secretary for Ireland, and in the next year he was chosen Speaker, a post which he held till compelled by illness to retire in 1817. He was raised to the peerage in response to an address of the House of Commons.

Colchicum autumnale, the so-called meadow saffron, or autumn crocus, is a British plant belonging to the *Melanthaceæ*, and so differing from the crocus, which it resembles externally, in having a superior (though subterranean) ovary and six stamens. It grows abundantly in limestone pastures in the west of England, and is also collected for pharmaceutical purposes in Germany. It has a solid bulb, bearing in spring broadish leaves, like those of the tulip, which die down in summer. The flowers, which are white or pale violet, coming in autumn without leaves, are known colloquially as "naked ladies." After flowering, the stalk bearing the capsule lengthens. Colchicum is employed medicinally in the treatment of acute gout. In suitable cases it gives speedy relief, but, unfortunately, it is not of such certain efficacy where the disease has become chronic. Colchicum is an intestinal irritant and produces vomiting and purging when given in full doses. It is either given in the form of tincture or of vinum colchici, or one of the two pharmacopœial extracts is made up with other ingredients into the form of a pill.

Colchis, in ancient geography, a district of Asia Minor at the E. end of the Black Sea, and lying just S. of the Caucasus. It is first spoken of by name by Pindar and Æschylus, and was in mythology the home of Medea and of sorcery, and

the object sought for by the Argonauts who went to find the golden fleece. It afterwards came into the power of Mithridates, and upon his defeat by Pompey it became a Roman province, afterwards incorporated with Pontus. Its inhabitants presented such a variety of type and nationality that all sorts of theories—none quite satisfactory—were started to account for their presence.

Colcothar is the residue obtained when ferrous sulphate or copperas is heated for the production of fuming sulphuric acid. It consists of red oxide of iron (Fe_2O_3), and is employed for polishing stones, etc., and a pigment. It is also known by the name of *caput mortuum*.

Cold. [CATARRH.]

Cold, the absence of heat. No body is absolutely cold; it must contain a certain amount of heat. The degree of cold is usually measured by thermometry, that is, by noting its temperature. The sensation of cold that a body may give is only estimated relatively, by comparison with its surroundings and with the human body. If when left to itself it gives out less heat than it receives, it is said to be colder than its surroundings. The second law of thermodynamics states that heat cannot pass from a colder to a hotter body without employment of external energy to effect the transfer. It is not that the coldest body in a system does not radiate heat out from itself, but it receives more than it gives, and the exchange is in effect the same as if cold were existent and were radiated from the body. [HEAT, THEORY OF EXCHANGES.] Varying degrees of cold may be obtained by the use of certain mixtures, generally termed *freezing-mixtures* (q.v.). Thus, if equal parts of ammonium-nitrate and water be mixed together a lowering of temperature to the extent of 26°C . may be effected. About the same effect is produced by mixing five parts of snow or pounded ice with two parts of common salt. The rapid evaporation of alcohol or of sulphurous acid will also produce a lowering of temperature of bodies in the neighbourhood.

Coldstream Guards, a regiment of foot raised by Monk, who was killed at Marston in 1660. The Coldstreamers were first clothed in the bearskin, a white tunic, and their tunic-buttons were of silver.

Cole, VICAR, a name of a vicar, born at Plymouth in 1780. He was a Surrey scenes. He was a member of the Royal Academy of Arts, and was elected R.A. in 1880.

Coleman, a name of a writer, born in 1817, an English clergyman, writer on mathematics, and colonial bishop. For four years he was a master at Harrow, and then for four years tutor at Cambridge, and in 1846 he was appointed rector of Forncett St. Mary. The same year saw him appointed Bishop of Natal, where he gave himself vigorously to the study of the Zulu character and language. His objection to the doctrine of eternal punishment expressed in 1861, and his calling in question the accuracy and authenticity of the Mosaic books in 1862 and 1863, brought about his condemnation by the ecclesiastical authorities and his deposition from his see by his Metropolitan, Bishop Gray, of Capetown. On appeal, the Privy Council declared the deposition null and void, and the Master of the Rolls declared him entitled to his income, which had been refused him by the Colonial Bishops' Fund. In 1869 Bishop Gray excommunicated him, and consecrated a Bishop of Maritzburg. In 1874 Bishop Coleman visited England to consult over his position, and to plead the cause of the Zulus as against the Boers, and on his return to Africa did all that was in his power to prevent the Zulu war. He died at Durban. Besides his theological works, he wrote *Ten Weeks in Natal*, and his books of arithmetic and algebra are still textbooks.

free-trade between Great Britain and India. He published a Sanscrit grammar and dictionary, and read many valuable papers to the Asiatic Society, of which he was a director.

Colenso, a village in N. Natal, which was the scene of much fighting during the Transvaal War (1899-1902). In the Battle of Colenso, General Buller was repulsed by the Boer forces.

Colenso, JOHN WILLIAM, D.D. (1814-1883), an English clergyman, writer on mathematics, and colonial bishop. For four years he was a master at Harrow, and then for four years tutor at Cambridge, and in 1846 he was appointed rector of Forncett St. Mary. The same year saw him appointed Bishop of Natal, where he gave himself vigorously to the study of the Zulu character and language. His objection to the doctrine of eternal punishment expressed in 1861, and his calling in question the accuracy and authenticity of the Mosaic books in 1862 and 1863, brought about his condemnation by the ecclesiastical authorities and his deposition from his see by his Metropolitan, Bishop Gray, of Capetown. On appeal, the Privy Council declared the deposition null and void, and the Master of the Rolls declared him entitled to his income, which had been refused him by the Colonial Bishops' Fund. In 1869 Bishop Gray excommunicated him, and consecrated a Bishop of Maritzburg. In 1874 Bishop Coleman visited England to consult over his position, and to plead the cause of the Zulus as against the Boers, and on his return to Africa did all that was in his power to prevent the Zulu war. He died at Durban. Besides his theological works, he wrote *Ten Weeks in Natal*, and his books of arithmetic and algebra are still textbooks.

Coleoptera. The order of Insects including those forms in which the anterior wings are hardened into a pair of horny sheaths, which protect the soft hinder flying wings; the former are known as the *elytra*. The Coleoptera is numerically by far the largest of the orders of Insects, and includes more than 100,000 species. These are generally known as beetles; but this name is very loosely applied, including many forms, such as the Black beetles, which are not true Coleoptera, and excluding many groups, such as the Turnip Fleas, which really belong here. Among other characters that separate the Coleoptera from the other orders of Insects, in addition to their wings, are the following: (1) The mouth parts are adapted for biting instead of sucking; (2) and the metamorphosis is complete, i.e. between the adult flying stage and the larval grub stage there intervenes a period of rest, during which the insect is enclosed in a pupa. These three stages correspond to the caterpillar, chrysalis, and butterfly stages of the butterflies and moths. These characters enable us to assign to the Coleoptera certain insects which have lost their wings, or in which these are rudimentary, often being concealed beneath the two elytra, which have fused together. For an account of the anatomy of a type of this order see STAG-BEETLE. The Coleoptera have a very varied mode of life. Many are aquatic, such

as the Whirligig Beetles (*Gyrinida*) and *Dytiscous*; the larvæ of the latter are known as "fresh-water shrimps." Others are parasitic; and others, like the Cockchafers, at least in the larval stage, live on the roots of plants, to which they may do serious damage. A large number lay their eggs in dung, and upon this the larvæ feed. In the Weevils the eggs are placed in the kernel of a nut, through the shell of which the grubs bore their way at the end of larval life. The Bacon Beetles (*Dermestus*) lay their eggs in bacon, in which the larvæ live. The largest of the British species is the Stag-Beetle. [GLOW-WORMS, WEEVILS, LADYBIRDS, DEVIL'S COACH HORSE.]

Colepepper, JOHN, an English cavalier and statesman of the 17th century. Born in Sussex, and entering upon foreign service, he was returned to Parliament in 1640 for Kent. Two years later he was Chancellor of the Exchequer, in the next year Master of the Rolls, and in 1664 Lord Colepepper. He was alive at the Restoration.

Coleraine, a municipal borough, county town and seaport of the county Londonderry, on the Bann, four miles from its mouth, and 145 miles north of Dublin. A stone bridge of three arches over the Bann joins the two parts of the town. The town has two parish churches, two Catholic churches, and several schools. The chief industry is manufacture of linen, one kind of cloth taking its name from Coleraine. Pork curing and eel and salmon fisheries are also carried on. At Portrush a harbour is formed by two piers, and there is a considerable trade. Population (1901), 6,929.

Coleridge, HARTLEY (1796-1849), an English man of letters, the son of the poet S. T. Coleridge. Born at Clevedon in Somerset, he passed his early years at Keswick, where he was in company with his father, Wordsworth, De Quincey, and Professor Wilson. He went to Oxford in 1815, and there displayed much of his father's great powers as well as his weakness of purpose. His want of early discipline led him to succumb to the temptations of university life and to take to drinking. Elected a Fellow of Oriel, he lost his fellowship during his probationary year, and being presented by the authorities with £300, he came to London for three years, and wrote short poems for the London magazines. He next tried for five years to carry on a school at Ambleside. This proving a failure he retired to Grasmere, and passed the rest of his life in literary work, much beloved for his many charming qualities by all about him, whose affection for the man was proof against his weaknesses. He wrote *Essays* for *Blackwood*, *Lives of Northern Worthies*, and in 1839 *The Life of Massinger*, his last work. His prose style is good, and of his poems, in which Wordsworth's influence is to be traced, the best are his *Sonnets*, and an unfinished lyric drama, *Prometheus*.

Coleridge, JOHN DUKE, LORD, an English lawyer, son of Sir J. T. Coleridge, was born in 1821. Educated at Eton, and at Oxford where he was made Fellow of Exeter College, he was called to the bar, and practised on the Western Circuit, of

which he became leader. In 1855 he became Recorder of Portsmouth, took silk in 1861, and represented Exeter in Parliament from 1865 till his appointment as Chief Justice of the Common Pleas, and Baron Coleridge. He was Solicitor-General in 1868, and Attorney-General in 1871. In 1880 he was made Lord Chief Justice of England. Of great eloquence as an advocate, most people remember him as the cross-examiner of the claimant in the Tichborne case. He died in 1894.

Coleridge, SIR JOHN TAYLOR (1790-1876), an English judge, nephew of the poet, born at Tiverton, and contemporary with Arnold and Keble at Corpus Christi College, Oxford. After a brilliant undergraduate career, he became Fellow of Exeter, and was called to the bar in 1819, practising on the Western Circuit. In 1824 he edited the *Quarterly Review* for a year, and in the next year published his edition of *Blackstone's Commentaries*. In 1832 he became Serjeant, and in 1835 a judge of King's Bench, a post which he retained till 1858, when he was made Privy Councillor. In 1869 he wrote a *Memoir of the Rev. John Keble*.

Coleridge, SAMUEL TAYLOR, poet, philosopher, theologian, critic, and journalist, was born on Oct. 21, 1772, at Ottery St. Mary, Devon, the youngest of ten children of the Rev. John Coleridge, vicar of the parish, and head master of King Henry the Eighth's free grammar school. Until his father's sudden death, in his ninth year, he was educated at home; in the following year, on July 18, 1782, he was entered at Christ's Hospital, where he remained eight years, entering Jesus College, Cambridge, early in 1791. Before going to Cambridge he had been smitten with the idea of becoming a surgeon, and read a vast number of books on surgery; then he had immersed himself in metaphysics, until in his eighteenth or nineteenth year he was won from philosophy to poetry by Bowles's sonnets. This "long and blessed" interval lasted for some ten or twelve years. His discursive mind, however, was even during this period much occupied by other subjects as well, particularly politics and theology, in both of which he was in those days an ardent Liberal. In 1793, under stress of pecuniary difficulties, he found his way to London, and enlisted as a private in the 15th Light Dragoons, under the name—which preserved his initials—of Silas Tomkyns Cumberbach. His scholarship, however, betrayed him, and within about four months he was bought out, and went back to Cambridge, where in the ensuing year he made himself known as a poet by publishing *The Fall of Robespierre*. Before this time he had gone with Southey to Bristol on a visit to the latter's aunt, and, being introduced to the family of a Bristol sugar-maker, named Fricker, had become engaged to one of the daughters, Sara, whom he married on Oct. 4, 1795. Another of the sisters became the wife of Southey, a third was already at the time of the Bristol visit married to their common friend Lovell (a Quaker), and a fourth refused Burnett, another of their friends. Between them the little band of enthusiasts formed the design of emigrating to the banks of the Susquehanna,

in America, there to form a communistic society to be known among men as a "pantisocracy." The scheme never came to anything, and Coleridge took up his temporary abode in a cottage at Clevedon, Somerset, selling a volume of poems to Joseph Cottle, the Bristol bookseller, for thirty guineas, and delivering a course of political lectures. In 1796 he started a weekly miscellany under the title of *The Watchman*, himself canvassing for subscribers; but the paper had soon to be abandoned. He then (1797) lived for a time with his friend Thomas Poole at Nether Stowey, in a cottage placed at his service by another friend, Charles Lloyd, son of a Birmingham banker. While at Nether Stowey he wrote, under the title of *Osorio*, the drama long afterwards published as *Remorse*. Ultimately accepted at Drury Lane, on Byron's recommendation, it was produced there on Jan. 23, 1813, and was for those days a success, having a run of twenty nights. He also wrote another drama, *Zapolya*, which was published in 1818, but never acted. *The Ancient Mariner*, which appeared in the first volume of the *Lyrical Poems* (1798), was begun in collaboration with Wordsworth, who, however, contributed to it little beyond the idea of the albatross. *Christabel* was commenced about the same time, but did not see the light for eighteen years, and then only as a fragment. In January, 1798, Coleridge, who had from his early years been a singularly profuse and impressive talker, undertook a Unitarian pastorate at Shrewsbury, but speedily abandoned it at the instance of the Wedgwoods, sons of the potter, who gave him an annuity of £150 that he might devote himself to poetry and philosophy. His work as a poet, however, was nearly over, for he did little afterwards in this kind but lament his failing powers. After a visit to Germany in 1798-99 with the Wordsworths, one result of which was his translation of Schiller's *Wallenstein*, he stayed for a while in London, and did a good deal of excellent work for the *Morning Post*. In 1800 he made his home at Greta Hall, Keswick, and there, taking the "Kendal black dog" as his emblem, he suffered from rheumatic and neuralgic pains, and was obliged to leave the place on account of reckless bathing in the lake. He returned to school days, began to eat again, and in April, 1801, he was able to leave the benefit of his health. In 1802 he was secretary to the Ball. Returning to Keswick, he lived from place to place, delivering lectures at the Royal Institution. In 1808, started a new paper, the *Friend*, in August, 1809, and in 1810, delivered a course of lectures at the Royal Institution. In 1812, and in 1813, he was again in London, and in 1814, he was at Highgate, where he remained from the autumn of 1814 to the autumn of 1815. In July 1815, he was again in London, and in 1816, he was at Highgate. While at Highgate, he wrote a monologue, and in 1817, he was at Highgate. In 1818, he was at Highgate, and in 1819, he was at Highgate. In 1820, he was at Highgate, and in 1821, he was at Highgate. In 1822, he was at Highgate, and in 1823, he was at Highgate. In 1824, he was at Highgate, and in 1825, he was at Highgate. In 1826, he was at Highgate, and in 1827, he was at Highgate. In 1828, he was at Highgate, and in 1829, he was at Highgate. In 1830, he was at Highgate, and in 1831, he was at Highgate. In 1832, he was at Highgate, and in 1833, he was at Highgate. In 1834, he was at Highgate, and in 1835, he was at Highgate. In 1836, he was at Highgate, and in 1837, he was at Highgate. In 1838, he was at Highgate, and in 1839, he was at Highgate. In 1840, he was at Highgate, and in 1841, he was at Highgate. In 1842, he was at Highgate, and in 1843, he was at Highgate. 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of "the most surprising talker extant in this world," recorded in his *Life of Sterling*, are wrought into one of the most vivid and life-like of his portraits. After Coleridge's death, his friend, Mr. Joseph Henry Green, an eminent surgeon and Fellow of the Royal Society, who had had much intercourse with him at Highgate, set himself to systematise and develop his philosophy, giving to the task the remaining thirty years or so of his life, and leaving behind him in MS. the work published in 1865 as *Spiritual Philosophy: founded on the Teaching of the late Samuel Taylor Coleridge*. In addition to the works of Coleridge already named, he published *The Statesman's Manual* in 1816, *Sybilline Leaves* and *Biographia Literaria* in 1817, and *Aids to Reflection* in 1825. Four volumes of *Literary Remains* appeared posthumously in 1836-38, *Confessions of an Enquiring Spirit* in 1840, and an *Essay on Method* in 1845. As a poet, slender and fragmentary as was his work, Coleridge showed forth qualities of the highest order, which, had they been allied with stronger character, might have placed him in the same rank with Wordsworth. His inconsequence as a philosopher and theologian admits of the same explanation. As a journalist he has had the unstinted admiration of competent judges. But it was as a critic of poetry and the drama that he came nearest to doing himself justice. He was just in time to save his country from having to learn the supreme greatness of Shakspeare from a German; his separation of the great from the little in Wordsworth is final and conclusive; his formulation of the laws of poetry is the luminous and convincing work of one who was at once poet, philosopher, and critic. Altogether he was, without controversy, the most profusely gifted, if the least effectual, genius of a great generation.

Coles, COWPER PHIPPS (1819-1870), an English naval architect, was born in 1819, entered the navy and became captain in 1856. He was the great advocate and in part inventor of the turret ship. The *Captain*—a turret-ship built from his designs—was commissioned in 1870, and on the 7th of September of that year capsized in a gale off Cape Finisterre, Captain Coles himself and almost all on board being drowned. A tablet in St. Paul's commemorates this event and gives the names of those lost.

Colet, JOHN (1466-1519), a celebrated Dean of St. Paul's, and friend of Erasmus. Born in London, he was educated at St. Anthony's school, and at Magdalen College, Oxford, where he studied especially logic and philosophy. In 1493 he went to Paris and to Italy to perfect himself in Greek and Latin. He was ordained on his return to England in 1497, and in 1505 he was made first prebendary and then Dean of St. Paul's. He established a divinity lecture on three days in the week at St. Paul's, and in 1512 founded and endowed St. Paul's School, of which the Mercers' Company were made trustees, and William Lilly the first master. His views were so much in advance of those of his colleagues upon many points that he was looked on as little better than a heretic, and was so molested

that he determined to retire, but died before doing so. He wrote a great number of works, chiefly on theological subjects, but among them were *Letters to Erasmus*, and *Rudiments of Grammar*.

Colfax, SCHUYLER (1823-1885), an American journalist and politician, born at New York. In 1845 he acquired a newspaper in Indiana and made it an influential Whig journal. From 1854 till 1869 he was a Republican member of Congress, and was three times chosen Speaker. He was chosen Vice President of the United States in 1868, but, being implicated in certain political charges in 1873, he retired into private life.

Colibri, the French name for a Humming-bird (q.v.).

Colic, or intestinal pain, is a symptom which may arise from the most trivial or the most grave and serious causes. The frequent occurrence of griping pains in the abdomen, causes colic to be looked upon by the public as quite a simple disorder eminently suited for domestic practice, and yet there is perhaps no symptom which the physician is inclined to treat with greater respect. Spasm of the muscular coat of the intestines may be set up by so prosaic a cause as the taking of some article of food which disagrees, as the phrase is, with the patient; or it may form a striking feature in that most alarming of conditions which is known to medical men as intestinal obstruction. In the former case a purge soon removes the source of trouble, in the latter this form of treatment is more fraught with danger to the patient than any plan of action which could be devised. In dealing with colic, therefore, it is most necessary to study carefully the whole of the phenomena present in each individual case, and not to imagine that any particular plan of treatment will comprehend all the multifarious forms of disease which are associated with abdominal pain. The pain of colic is often referred to the navel, or it may shift about from one part of the abdomen to another; it is usually not aggravated by pressure. Pain originating in parts within the abdomen other than the intestines may closely simulate true intestinal colic. Thus the site of trouble may be the stomach, or the pain may be due to gall-stone, renal calculus, vertebral disease, uterine disorders, aneurism, or peritonitis. In the common and familiar colic, consecutive to the swallowing of something which disagrees, diarrhoea (q.v.) is usually present. Colic is often associated, too, with constipation (independent of any actual obstruction), particularly in women of middle age. Again in lead poisoning [LEAD], whether in painters, or arising from drinking water which contains lead as an impurity, colic is a prominent symptom. Again, colic may be nervous in origin, a low state of health manifesting itself in some persons as colic, just as it does in others as neuralgia or megrim. In intestinal obstruction [INTESTINE] there are usually present, in addition to pain, constipation and vomiting. It sometimes falls to the lot of the physician to discover, on examination of the abdomen in "colic," such conditions as typhlitis (q.v.) or strangulated hernia. [HERNIA.] The treatment of colic is, it

will be gathered from what has been said, best conducted on very simple lines. Pain is often relieved by the application of warmth in the form of a poultice or of hot flannels, or in children of a warm bath. Opium, or castor oil and opium, are invaluable in certain cases; the difficulty is to know which the cases are, hence their administration had far better be left to the medical man. Opium is, of course, especially to be avoided in the case of children. Strong purgatives should on no account be given save under professional advice. There is less objection to an enema; indeed, the treatment by the use of an injection is very useful in many cases of colic. In all instances, however, where abdominal pain persists unrelieved by the simplest measures, the best plan is to go for the doctor.

Coligny, GASPARD DE (1517-1572), a French admiral. Born at Chatillon, he came to court in 1539 and became the friend of Francis of Guise. He took part in the campaign of 1543, and was twice wounded, and was knighted on the field of battle during the Italian campaign of 1544. He took part in several other campaigns, and was made admiral. In 1554 a quarrel between Francis and Coligny broke out, and after Coligny's conversion to Huguenot views a little later this quarrel was changed to open and violent hostility. In 1562 the Civil war began, but the assassination of Francis in 1563 led to the maintenance of peace for some years. After another outbreak of war with various results, from 1567 to 1570, peace was again concluded and Coligny returned to court, where he rose into favour with Charles IX. He proposed to the king a descent on Spanish Flanders with a joint army of Catholics and Huguenots to be led by the king, and this proposal so alarmed the queen-mother that she determined on the massacre of St. Bartholomew. On the 22nd of August, 1572, Coligny was shot at and wounded in the streets, and two days later, on the night of the massacre, he was slain. Catherine seized and burned his papers, among which was—it is said—a good history of the Civil war.

Colima, the capital of a state of the same name in Mexico. The town, which is well built and paved and has regular streets, is in a fertile, well-watered plain, and has a considerable trade in cotton, linen, and woollen goods, and hardware. The port, Manzanilla, is about 60 miles west of the town, and has a good and well-sheltered anchorage, but is unhealthy, owing to the proximity of a stagnant marsh. The volcano of Colima (12,000 ft. high) is about 30 miles to the N.E., and emitted smoke and steam before the earthquake of 1868, and was in eruption in 1869. Colima was founded in 1522, and was made a city in 1824.

Colin. [VIRGINIAN QUAIL.]

Collect, a term for the short prayers which in the English Church precede the Epistle for the day, and are used also in other parts of the liturgy. They are said to have been originally prayers used in services preceding the mass—*oratio ad collectam*. The use of collects finds little or no place in the Eastern Church.

Collections, a name applied at Oxford University to examinations held in each college (usually at the end of term) for its own members, quite distinct from University examinations, and having for their ostensible object the ascertainment of a man's diligence during the term. The formidable part of collections is, or was, the appearance before the head and fellows, on which occasion a man's delinquencies and shortcomings are brought out and dwelt upon.

College (Lat.), a society. It was applied to almost any guild or association. Thus, in ancient Rome there was a College of Augurs, in modern Rome there is the College of Cardinals, Scotland has its College of Advocates, and England its College of Heralds. At the Universities the college strictly signifies the chartered corporation of head, fellows, and scholars, though its name is also used to include the general body of undergraduate members whether scholars or not. [MASTERS.]

College of Arms. [HERALDS' COLLEGE.]

Collegiate Churches are such churches as partake in some measure of the nature of a cathedral, that is, they have deans, canons, and chapters, and daily choral service, but they are not the seat of a bishopric. They are comparatively rare in England, but Westminster Abbey and Heytesbury in Wiltshire are instances.

Collembola, one of the two orders of insects known as the APTERYGOGENÆ, on account of the complete absence of wings, not only from the living forms, but probably also from all their ancestors. They are popularly known as "Spring-tails," as they are provided with a springing apparatus situated on the under side of the body and usually tucked up under the abdomen. The typical genus is known as *Podura*, and is common among cool and damp leaves, beside pools. [PHYSANURA.]

Colley, SIR GEORGE, an English soldier, entered the army in 1751, and received an ensigncy in the 1st Foot Guards. He was a border magistrate in Scotland, and served in China in 1762. He was a major at Plymouth in 1763, and a Staff Officer in the Ashantee campaign. He was with General Wolseley in the private secretary to the Governor of India, and was killed at the action of the 18th of February, 1881.

Collier, a name applied to a dog, now generally understood to be a cross-bred between a terrier and a spaniel, for which both were formerly used. They should stand tall, be lithe, and have a strong, straight back.

feather to the heel, and small, somewhat round feet. The head should be long and sharp, with small semi-erect ears. The colours are black and tan, black, white, and tan, black and white, sable, and grey. The coat is double: the under coat is short and close like sealskin, and well-fitted to resist the damp; the outer coat is harsh and coarse; in rough collies the latter is long, in smooth collies it is short. The former carry a good deal of feather on the fore legs and on the hind legs down to the hock, and the long outer coat forms a kind of ruff which is absent in the smooth collie. Wonderful stories are told, on good authority, of the intelligence of this breed when employed as sheep-dogs. Their only drawback as companions is a somewhat uncertain temper, which, however, is more apt to be manifested to strangers than to the animal's master or mistress, to whom it is ordinarily devotedly attached.

Collier, ARTHUR (1680-1732), an English metaphysician, born at Longford Magna, Wiltshire, where his father held a family living. After passing through an Oxford course, he became in his turn rector of Langford in 1704. While he was at Balliol he had turned his attention to Descartes and Malebranche, and he gave to the world his views in 1713, when he published his *Claris Universalis*, to demonstrate the non-existence and the impossibility of an external world. His view bears a striking resemblance to that of Berkeley (q.v.). Other works of Collier's are *A Specimen of True Philosophy* and *Logology*.

Collier, SIR GEORGE, British naval commander, was born in 1738, entered the Royal Navy in 1751, and was raised to the rank of commander in 1761 and to that of captain in the following year. He had, however, no chance of gaining distinction until the outbreak of the American war. He then commanded the *Rainbow*, 44, and captured, among other vessels, the *Hancock*, 36, after a long chase. He also destroyed the stores which had been collected for an American expedition against Nova Scotia, and, before the conclusion of hostilities, became commander-in-chief (as commodore) on the North American station. As such he led a very successful expedition to the Chesapeake, and was most active in the neighbourhood of New York. His last exploit there was to destroy the whole force of the enemy in the Penobscot. Sir George, who had been knighted in 1775, took part in 1780 in Darby's relief of Gibraltar. He attained flag-rank in 1793, and died a vice-admiral in 1795.

Collier, JEREMY (1650-1726), a famous non-juring clergyman, who was born in Cambridgeshire and educated at Caius College, Cambridge. He took orders, and became rector of Ampton, near Bury St. Edmunds. He then came to London, and was lecturer at Gray's Inn in 1685. After the Revolution he could not reconcile himself to the new powers, and was twice committed to Newgate, once for writing in defence of the Stuart claim, and once for an alleged treasonable correspondence. But his great offence against Government was the giving absolution to Sir John Friend and William

Perkins, who were executed for an attempt to assassinate William III. For this he was forced to fly the country, and he remained under sentence of outlawry for the remainder of his life, though after a time he returned to London and devoted himself to literature. In 1697 he published *Essays on Several Moral Subjects*, and in 1698 his famous *Short View of the Immorality and Profanity of the Stage*, a work which brought him into collision with Congreve, Vanbrugh, and others, who turned him into ridicule. Macaulay has praised to some extent what he wrote, and it certainly had the effect of purifying the stage. He also translated into English a *Dictionnaire Historique*, and wrote an *Ecclesiastical History of Great Britain*, and in 1725 he published some *Practical Discourses*.

Collier, JOHN, commonly known as "Tim Bobbin," was the son of a curate at Stretford, near Manchester. From 1739 to 1786 he was master of a school at Milnrow, Rochdale, and used to write satirical verses which were accompanied by grotesque drawings. In 1739 he published a rhyming satire, called *The Blackbird*, and in 1775 his *View of the Lancashire Dialect*, which had a great success. Others of his works are *Truth in a Mask*, *The Fortune Teller*, and *The Human Passions*, a set of 120 engravings with explanatory verses.

Collier, JOHN PAYNE (1789-1883), a Shakspearian critic and commentator, who was the cause of much controversy upon the point whether he did or did not forge some alleged old marginal notes in a copy of the Second Folio of Shakspeare (1632) called, from the name on the cover, "the Perkins folio." He strenuously denied it, but the weight of evidence against him seemed overwhelming. He was the son of a reporter and journalist, who was a companion of Lamb, Hazlitt, Coleridge, and Wordsworth. The boy took to writing at a very early age, and became a parliamentary reporter. In 1829 he was called to the bar. It was in 1820 that he made his first serious effort in literature by the publication of a *Poetical Decameron*. He next produced a *History of English Dramatic Poetry to the time of Shakspeare and the annals of the Stage to the Restoration*; and in consequence of this work he became librarian to the Duke of Devonshire, and so gained access to valuable MSS. and early editions. From 1835 to 1839 he brought out new facts as to the life and works of Shakspeare, and in *Shakspeare's Library* he gave the poems, tales, and novels upon which Shakspeare based his plays, and from which to some extent he drew his materials. He did much editing for the Camden Society Papers and for the Shakspeare Society. His *Notes and Emendations* contained the alleged forgeries, which involved him in a great amount of trouble and odium. The British Museum experts reported on them very unfavourably to him in 1860. In 1847 he was appointed secretary to the Royal Commission on the British Museum, and in 1850 he retired to Maidenhead. He produced many other works besides those mentioned.

Collier, ROBERT POWELL. [MONKSWELL.]

Collimation, the adjustment of the axis of a telescope so as to coincide with its optical axis. The elimination of errors of collimation are important to surveyors in theodolite work, and still more so to astronomers in the use of the transit-telescope.

Collimator, a word falsely derived, and more correctly written *collineator*. In a corrupt Latin MSS. the verb *collimare* was found in the sense of to put in line with, to aim at. Hence the word *collimator*, which is a term used in astronomy. The collimator is an auxiliary telescope, which enables the deviation between the true axis and the observer's line of sight to be ascertained, and so accuracy to be secured. In the spectroscope the collimator is a slit in the object-glass, by which the rays pass from the prism.

Collingwood, CUTHBERT, BARON, British naval officer, was born in 1750 at Newcastle-on-Tyne. He received some education at the grammar school of the town, but in 1761 was removed from it at the desire of his maternal uncle, Richard Brathwaite, who, being in that year made captain of the *Shannon*, 28, took the boy to sea with him. Collingwood served on shore at the battle of Bunker's Hill, and so much distinguished himself that on the very day of the action (June 17, 1775) he was promoted to be lieutenant. In 1776 he was appointed to the *Hornet* sloop and sent to Jamaica, where he moved into the *Lowestoft*, in which ship Nelson was also a lieutenant. Thenceforward, the two, who had previously known one another, became devoted friends. When Nelson was transferred to the *Bristol*, Collingwood succeeded him as first lieutenant of the *Lowestoft*; when Nelson was promoted to command the *Badger*, Collingwood took his place in the *Bristol*; and when Nelson, in 1779, was posted to the *Hinchinbroke*, Collingwood was made commander of the *Badger*. Finally, when Nelson left the *Hinchinbroke* for a larger ship, Collingwood was posted as his successor. In his next ship, the *Pelican*, he was in August, 1781, wrecked upon the Morant Keys. As no blame attached to him, he was soon afterwards appointed to the *Samson*, 64, in which he served until the proclamation of peace in 1783. During the early part of the peace he commanded the *Mediator* in the West Indies, where his friend Nelson commanded the *Boreas* at the same time. From 1786 to 1790 he was able to live at home in Northumberland, but in the latter year he was appointed to the *Mermaid*, 32, and again paid a visit—this time a brief one—to the West Indies. On his return he married Sarah Blakett, by whom he afterwards had two daughters. Upon the outbreak of the great war in 1793 he was appointed to the *Prince*, flagship of Rear-Admiral Bowyer, with whom he removed into the *Barfleur* and took part in the action of the Glorious First of June, 1794, when the ship lost 34 killed and wounded. Two months after the battle he removed to the *Hector*, 74, and afterwards to the *Excellent*, 74, in which he reaped much glory in the hard-fought battle of Cape St. Vincent on St. Valentine's Day, 1797. He remained with Lord St. Vincent's fleet

Cotton *gossypium* **English**
lyric *gossypium* **thesman.**

Collinson, PETER, an enthusiastic horticulturist, was born in 1694, either in London or near Windermere, being of a Westmoreland family

belonging to the Society of Friends. He was a woollen-draper, but kept up a large garden till 1749 at Peckham, and subsequently at Mill Hill. He employed John Bartram to collect novelties for him in America, and was the friend and correspondent of Franklin, Linnæus, Sloane, Derham, and other naturalists of his time. He contributed to the *Gentleman's Magazine* from 1751 to 1766, was made F.R.S. in 1728, and F.S.A. in 1737, and died in London in 1768.

Collodion is made by dissolving gun-cotton (pyroxylin) in ether and rectified spirit. The liquid on exposure to the air rapidly loses its volatile constituents, and "sets" forming a jelly-like, tenacious, solid mass. If collodion be painted over an abraded surface, as evaporation occurs a protecting film is formed; moreover, this film tends to shrink, and so will serve to maintain the edges of a wound in apposition. From ordinary collodion is prepared *Collodium flexile* (collodion, 48; Canada balsam, 2; castor oil, 1); while *Collodium vesicans* is the name given to a solution of gun-cotton (one part) in blistering fluid (20 parts).

Colloids (Gk. *kolla*, glue), the term applied by Graham to substances which do not possess the power of passing, when in solution, through parchment or animal membrane; and gum, gelatine, glue, e.g. some forms of inorganic substances belong to this class. [CRYSTALLOIDS, DIALYSIS.]

Collet d'Herbois, JEAN-MARIE (1750-1796), a French republican, statesman, mountaineer, member of the Convention, and member of the Committee of Public Safety. He was born of an ordinary family, and became an actor, achieving a certain amount of dramatic success. In 1792 his *Almanach du Père Gérard*, written to advance and explain revolutionary principles, brought him into notice, and he was elected deputy. He proposed the abolition of royalty, and he voted for the death of the king. In 1793 he became a member of the Committee of Public Safety. Later he was sent with Fouché to carry out the decree of the Convention with regard to Lyons, i.e. to destroy it and change its name. They destroyed the ramparts and forts and a few houses, and as a quick way of getting rid of those found guilty of enmity to the Republic, they shot 339 people, acquitting, however, more than 1,800 accused. An idle tale has been set about that Collet d'Herbois did this because he was hissed at Lyons as an actor. Not only is there no proof of this, but the balance of evidence shows that he had been a popular actor there. An attempt to assassinate Collet on his return increased his popularity and also the dislike of Robespierre for him. He was in Robespierre's proscription list, and took part in the movement that overthrew him. Nevertheless he was shortly afterwards denounced and banished to Cayenne, where he soon died.

Collotype, a term including a number of photographic printing processes which, though differing in details, all depend on the action of light upon a gelatine film sensitised by means of potassium bichromate. Such a film loses, in those places where the light has acted, its power of

absorbing water, but is able to receive greasy matter as printer's ink. A glass plate with the sensitised gelatine film upon it is therefore prepared and exposed to light under a photographic negative, which should be a "reversed" negative. It is then washed with cold water, and used as a "block" for printing from, only those parts which had been exposed to the light receiving the ink.

Collusion (from the Latin *collusio*, from *colludo*, to play together, to unite in the same play or game for the purposes of fraud or deception) is a deceitful compact between two or more persons to do or omit some act for the purpose of prejudicing the interest of some other person or persons, or for some improper purpose. In judicial proceedings it is a secret agreement between two persons that the one shall commence an action against the other, in order to obtain the decision of a judicial tribunal for some sinister purpose, and it is of two kinds:—(1) When the facts brought forward to warrant the sentence of the Court do not exist. (2) When they exist, but have been corruptly preconcerted for the express object of obtaining the decision. In either case the judgment thereby obtained is a nullity. Collusion between the petitioner and either of the respondents in presenting or prosecuting a suit for dissolution of marriage is a bar to such suit. So in bankruptcy, dispositions of a collusive character are void as against the trustee. [MARRIAGE, BANKRUPTCY.]

Collyrium, an eye wash.

Colman, GEORGE (1733-1794), the elder, an English dramatic writer, who was born at Florence, and educated at Westminster School and Christ Church, and having entered at Lincoln's Inn was called to the bar. In 1761 he produced his piece, *Polly Honeycomb*, which was very successful. His next best piece was, perhaps, *The Clandestine Marriage*, in which Garrick collaborated. In 1767 he became manager of Covent Garden, and in 1777 manager of the Haymarket. In 1785 he was attacked by paralysis, which affected his mental powers, and his public life was ended. Besides writing many plays, he made translations of Terence, Plautus, and Horace, and published both prose and verse.

Colman, GEORGE (1762-1836), the younger, dramatist, was educated at Westminster School and at Christ Church, and entered at the Temple. His first play—produced in 1782 at the Haymarket, then under his father's management—was the *Female Dramatists*, founded on *Roderick Random*. He succeeded his father in the management of the Haymarket, but difficulties beset him for some years. He was afterwards appointed Examiner of Plays, a post which he held till his death, and in which he managed to give great offence to his brother dramatists. Of his plays the best are, perhaps, *John Bull*, and the *Heir-at-Law*. He also published some grotesque verse, among it being *Broad Grins* (1802).

Colmar, the chief town of the German province of Upper Alsace, on the Lauch. A canal connects it with the Rhine, and it is on the railway

to Strasburg, from which city it is distant 40 miles. The cathedral is a historical monument of fourteenth-century architecture, and the tower commands a fine view of the Vosges. The thirteenth-century convent of St. Benedict Unter Linden has a perfect specimen of cloisters. The town possesses a good museum of paintings and works of art, and a library. There are manufactures of cotton, paper, leather wadding, and animal black, as well as breweries, distilleries, foundries, and tanneries. The Romans had a fortress here, called Columbaria. In 1697 Colmar became French under the Treaty of Ryswick, and in 1871 it again became German.

Colne, a market town of E. Lancashire, on a feeder of the Calder, and about 26 miles N. of Manchester. In the fourteenth century it was noted for its woollen manufactures; now its chief productions are calicoes and mousselines-de-laine; Archbishop Tillotson was educated here. Limestone and slate are worked close by. Pop. (1901), 23,000.

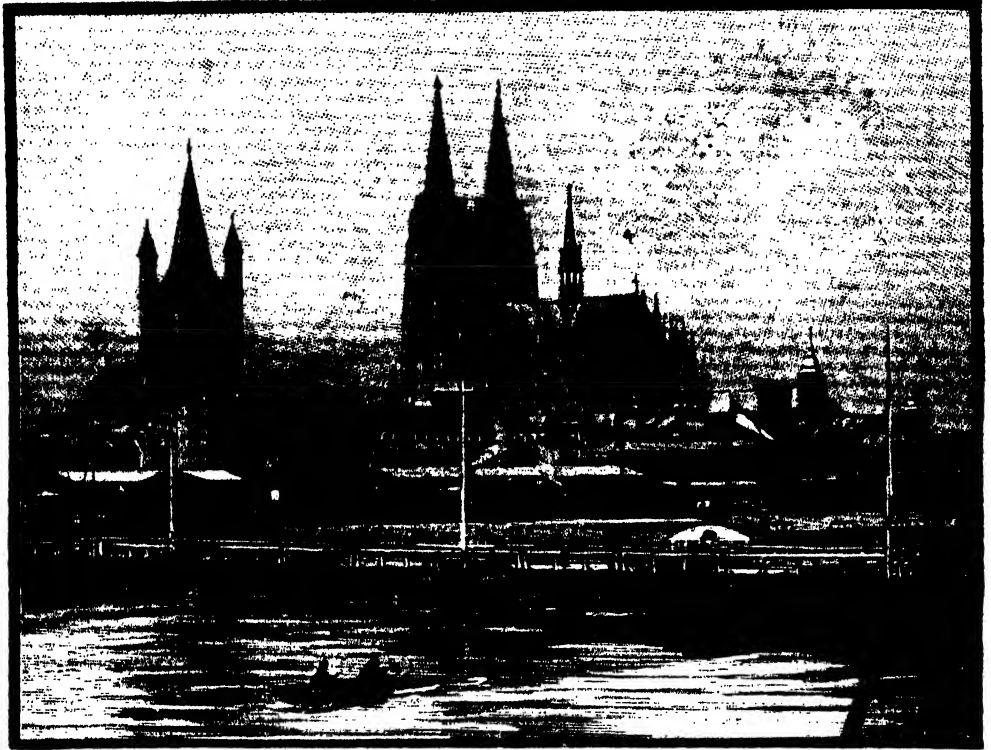
Colney Hatch, chiefly noted for its great lunatic asylum, is in Middlesex, about six miles N. of London.

Colocynth, *Citrullus*

Colocynthis, the bitter cucumber, is a member of the order *Cucurbitaceae*, native to Asia, but now widely diffused. There are three preparations of this drug in the Pharmacopoeia—*colocynthis composita*, *colocynthis coarctata*, and *colocynthis pilula*. *Colocynthis composita* is a mixture of the juice of the fruit with honey, and is used in the treatment of constipation. *Colocynthis coarctata* is a dried fruit, and is used in the treatment of constipation. *Colocynthis pilula* is a pill of the fruit, and is used in the treatment of constipation.

Cologne, in the Rhine Province, Prussia, is on the left bank of the Rhine, about 10 miles from the mouth of the Moselle. The city is situated on a high bank, and is one of the most important commercial centres of Germany. It is famous for its trade in wine and corn, and for its manufactures of cotton and woollen goods, silks, carpets, porcelain, soap, sugar, tobacco, and the noted eau-de-Cologne. In 1212 Cologne was an imperial city, a member of the Hanseatic league, rich, populous, and sometimes called the "Rome of the North." Petrarch admired it greatly. The discovery of America much injured its trade, the expulsion of the Jews in 1425 did it damage, and the persecution of the Protestants in 1618 harmed it still more. But the final blow to its prosperity was the closing of the Rhine by the Dutch in the eighteenth century. The river was closed till 1837, since which time Cologne has been steadily rising in prosperity. In 1794 it became French, but was restored to Germany in 1814.

the present building dates back to 1248. The spires were finished in 1880. It is in the form of the Latin cross, 480 ft. long, 282 ft. broad, and 154 ft. high, the towers and spires being over 500 feet. Cologne is noted for its relics. The shrine of the Three Kings is in the cathedral, the bones of St. Gereon and the 308 martyrs of the Theban Legion are in the church of St. Gereon, while the church of St.



COLOGNE CATHEDRAL AND THE CHURCH OF THE APOSTLES.

Ursula contains the bones of the 11,000 virgins. There are other public buildings of much interest, especially the thirteenth-century Rathhaus, of many architectural styles, and the twelfth-century Tempelhaus. Cologne is well situated for commerce, being in the centre of the Rhine trade, and communicating directly with Antwerp and the Low Countries, Germany, and Switzerland. Beside the trade in wine and corn, there are manufactures of cotton and woollen goods, silks, carpets, porcelain, soap, sugar, tobacco, and the noted eau-de-Cologne. In 1212 Cologne was an imperial city, a member of the Hanseatic league, rich, populous, and sometimes called the "Rome of the North." Petrarch admired it greatly. The discovery of America much injured its trade, the expulsion of the Jews in 1425 did it damage, and the persecution of the Protestants in 1618 harmed it still more. But the final blow to its prosperity was the closing of the Rhine by the Dutch in the eighteenth century. The river was closed till 1837, since which time Cologne has been steadily rising in prosperity. In 1794 it became French, but was restored to Germany in 1814.

Colombia, UNITED STATES OF, a South American Republic (formerly Federal, but centralised since 1886) in the N.W., between lat. 12° 25' N. and 5° 8' S. and long. 70° 40' and 82° 40' W., with an area of over half a million square miles. The Atlantic coast-line is over 1,000 miles, well

provided with bays and natural harbours, the chief of which are the mouth of the Magdalena, with its port Barranquilla, the bay of Cartagena, the bay of Portobello, and the harbour of Trinidad upon the island of Gorgona. In the west, Colombia is very mountainous, forming part of the Andes system. In the south is an extensive plateau, averaging from 10,000 to 11,000 ft. in height, and from this three ranges, almost parallel, branch off northwards. The Central Cordillera has the lofty snow-peak of Tolima, the Eastern is said to reach a height of 23,000 ft., and the Western, which extends most to the north, is in some parts little more than a series of rounded hills. The eastern part of the country makes part of the Amazon and Orinoco plains. These llanos extend from the slopes of the Cordilleras, and being almost treeless afford good pasturage. Farther south they have a more broken surface, and are covered with forests. The formations of Colombia are igneous and metamorphic, and the volcanic agency is still active. There are glaciers in the Cordilleras, and the slopes are often covered with gravel, and the valleys with alluvial deposits.

Most of the Colombian rivers belong to the Atlantic basin, the two most important being the Magdalena between the E. and Central Cordilleras, and the Cauca between the Central and W. Cordilleras, both flowing N. They unite before reaching the sea. The most important of the Orinoco rivers are the Guaviare, the Meta, and the Vichada. Among the less important rivers may be mentioned the Atrato, which flows into the Gulf of Darien, and has been thought to present a possible solution of the question of an inter-oceanic canal, and the river Iça, a tributary of the Amazon, which possesses many navigable branches and passes through a region rich in natural resources not yet developed.

Colombia is extremely rich in minerals, which have not yet been greatly worked, owing to defective communication. Alum. antimony, asphalt, coal, copper, gold, iron, lead, limestone, magnesia, mercury, platinum, potash, silver, and soda all abound, and amethysts and amber are found, while the emeralds have a world-wide reputation.

The climate of Colombia has great variations, owing to the irregularity of surface, and the fauna and flora are equally various. Agriculture and cattle-rearing are the chief industries, the latter especially in the Orinoco plains and the Savannahs of Panama. On the higher parts of the plains maize and wheat are grown, and lower come cocoa, coffee, cotton, rice, sugar, and tobacco. Almost the only manufactured articles exported are the Panama straw-hats, but there is a considerable export of raw produce.

The population consists of Indians and cross-breeds, Spanish creoles, and negroes. There are still a few wandering bands that represent the Chibchas, the most important of the tribes at the time of the Spanish conquest, and other savage tribes still exist to the number, it has been calculated, of about 150,000.

From the middle of the sixteenth century Colombia was a vice-royalty or presidency till, in 1819,

Bolivar united it with Venezuela and Ecuador into the Republic of Colombia. These two states afterwards withdrew. Since then Colombia has been the scene of almost continual struggles and changes. In 1903 Panama revolted from Colombia and established itself as a separate republic. It was at once recognised by the United States of America, who concluded a treaty with it with reference to the canal.

Colombo, a seaport town and capital of Ceylon, on the W. coast, in lat. 6° 55' N., and long. 77° 45' E. Part of the town is fortified and is on a rocky promontory surrounded by the sea on three sides, and protected on the fourth by a lake and moat. The town has many fine buildings and is supplied with water and gas. Among other marks of the Dutch occupation are the trees which shade most of the streets, and the cinnamon gardens. One part of the town—Pettah—is occupied chiefly by natives and half-castes; another, Colpetty, is a pleasant suburb. The harbour has been much improved of late by the construction of a breakwater, and has taken the place of Galle as a coasting station. The population of Colombo presents great variety, including Singhalese, Parsees, Chinese, Afghans, Arabs, Malabars, Persians, Kaffirs, descendants of Portuguese and Dutch, and all kinds of half-castes. The Arabs discarded the ancient name of the town and called it Kalambu, which the Portuguese changed to Colombo. The Dutch captured it in 1656, and surrendered it to the British in 1796.

Colon, the name given to a part of the large intestine. The colon is divided into three portions—the ascending, transverse, and descending, as they are termed. The ascending colon runs upwards from the cæcum towards the under surface of the right lobe of the liver; then it bends almost at right angles, and is continued transversely across the abdomen as the transverse colon; in the neighbourhood of the spleen, a second bend at a right angle carries the transverse into the descending colon, which runs downwards towards the left iliac fossa, and terminates in that portion of large intestine which is known as the sigmoid flexure. The junction of the ascending and transverse colon is termed the hepatic flexure, and the junction of the transverse with the descending colon is known as the splenic flexure of the colon. [INTESTINES.] In certain cases of intestinal obstruction it is necessary to open the colon by surgical operation; to such a procedure the term colotomy is applied.

Colonel (Lat. *columna*, a column, or, according to some, *corona*, a crown), a word used in the English army to denote the commander of a regiment. The post is becoming obsolete, and is only used to reward the services of a superior officer by giving him the pay attaching to it. Each battalion of a regiment is really administered by its own lieutenant-colonel. The colonelcy of a regiment is often bestowed as a compliment upon princes, even foreign ones, and upon crowned heads, and in some countries upon women.

Colonia, a province in Uruguay on the Plata, having an area of 2,185 sq. miles, and consisting of

fertile valleys and plains, where European colonists rear cattle and practise agriculture. The capital—same name—has a good harbour and dock.

Colonial Corps of the British army were regiments stationed in a colony for its defence exclusively, but paid for out of the Army Estimates. Such were the Cape Mounted Rifles, the Malta Fencibles, and other corps. They have gradually been disbanded, local militia being substituted. There are still, however, West India regiments the rank and file of which are negroes, and which are partly stationed in West Africa, and native troops at Ceylon and Hong Kong. Several Colonial corps were formed during the Boer War (1899-1902), volunteers coming from Australasia and Canada, as well as South Africa.

Colonial Office. English Colonies were originally under "The Board of Trade and Plantations," but in 1774 an Act was passed making Canada one royal government under the name of Quebec, and placing it under a Secretary of State for the Colonies, who is now always a member of the Cabinet. This office was for a time (1801-1854) united with that of the Secretary for War. In accordance with a pledge given by Lord Elgin at the Imperial Conference in 1907, the office has been reorganised, and now consists of three departments : 1, The Dominions Department, dealing with affairs of the self-governing dominions; 2, The Crown Colonies Department, dealing with the administration and political work of Crown Colonies and Protectorates; and 3, The General Department, dealing with the routine business of the office, and matters common to all Crown Colonies.

Colonies, in paleontology, consist, according to M. Barrande, who introduced the term in 1852 in his "Silurian System of Central Bohemia," of faunas, or assemblages of fossils which, though characteristic of a particular period, occur intermingled with those of another. They are explained as due to migration of organisms under special conditions; but, though this is a plausible hypothesis, it is true in the general sense that the term has been shown that M. Barrande's original conception of the term was too narrow, and that the term is now applied to all cases of faunal change, whether or not the change is due to migration of organisms, or to other causes, such as the deposition of new strata.

Colonna, a poetess, a member of the Colonna, and a constable of Naples, son of the Marquis. In 1511, she was married to a French nobleman, and in 1512, she was imprisoned in the Bastille. She was kept there for a year, and died of his illness. She was buried in the church of St. Louis, and her remains were transferred to the church of St. Louis in 1513. She was buried in the church of St. Louis, and her remains were transferred to the church of St. Louis in 1513. She was buried in the church of St. Louis, and her remains were transferred to the church of St. Louis in 1513.

having an area of 16 sq. miles, and rising at Cairn Nan Eim to a height of 493 feet. There are bone caves on the island, and some standing stones, and also an obelisk to the memory of Lord Colonsay. A little to the south, and separated by a passage which is dry at low water, is the small island of Oronsay, which has an Augustinian priory of the 14th century containing some effigies, and there is also a sculptured cross.

Colony, in the widest sense, is a settlement in some foreign and uncivilised country. Modern usage applies the term only so long as the settlement remains a dependency of the mother country. But the Greek colonies almost always, and the Phœnician frequently, were independent from the first. The latter were originally "factories" or trading ports. Some of them, however, grew into independent cities (Carthage for instance). Later the pressure of population in Greece caused numerous colonies to be founded on the Euxine, in Sicily and South Italy, and North Africa, between 730 and 500 A.D., almost always under the direction of the Delphic or some other oracle. These colonies (*apoikiai*) are to be distinguished from the mere trading posts, of which Miletus (for instance) had many on the Euxine. The first band of settlers was led by a founder, who gave the new city its laws and was worshipped after his death as a kind of patron saint. The *apoikia* was a city community politically independent (with one or two doubtful exceptions) of its mother city or "metropolis," and connected with it only by the tie of religious sentiment. The same relation is said to exist between certain pairs of villages in Russia, one of which traces its origin from the other. "Mother" and "daughter" villages were also recognised in early Germany. By about 470 B.C. hardly any more sites were available, and the pressure of population in Athens, and to some extent in Corinth, was then relieved by founding "kleruchies" (lit. allotments) on part of the territory of subject states. These settlements, which historians do not usually call colonies, as they had little (if any) separate political organisation, were really garrisons primarily, and secondarily relieved the pressure of population at home. Roman colonies had the same objects as these "kleruchies," but had a distinct municipal organisation. The two objects varied in relative importance at different periods. During the last century of the Roman Republic the object was mainly to provide subsistence for poor citizens. Under the Empire the colonies were always settlements of discharged soldiers, and were thus both a substitute for pensions and a means of securing the provinces. Cologne and Lincoln preserve the Roman name *Colonia*.

A few modern colonies have been convict settlements, or founded primarily as an outlet for population; but most have been founded originally with a view to trade. Venice in the Middle Ages had a number of dependencies in Albania, Greece, and elsewhere, held and governed solely in the interests of her trade. During the 15th century the Portuguese pushed their way along the West African coast, occupied Madeira, the Azores, and

points on the mainland, and were followed by the Spanish. In 1492 Columbus found his way to the West Indies; in 1497 the Portuguese doubled the Cape of Good Hope, and founded several trading ports (on the Venetian plan) in India. One or other of these nations speedily conquered various parts of South and Central America, solely, it would seem, with a view to the stores of gold and silver that existed there. [MERCANTILE SYSTEM.] Grants of land were, however, made to Spanish and Portuguese subjects, who settled and worked their estates much as they would have done at home. The English colonies were founded partly also with a view to obtain gold and silver, but were usually managed by commercial companies; Newfoundland was founded in 1607, Virginia in the same year. But the decay of the old land system in England and the religious difficulties stimulated emigration, as in the case of the Pilgrim Fathers [MASSACHUSETTS], and many of Cromwell's Irish and Scottish prisoners were sent by him to the West Indies and the Carolinas. So also after Monmouth's rebellion; and convicts were long sent to Virginia. The French colony in Canada was founded in 1603. [CANADA.] The Dutch gradually supplanted Portugal in the East 1602-1609, and founded Batavia (q.v.) in 1618. All European natives regarded their colonies at first as sources of a supply of gold and silver; when it was found that many of them did not contain it, their trade was put under oppressive restrictions to give the mother country the monopoly of their commerce. They were regarded as providing markets for its manufactures, and as furnishing it with valuable products which it could sell for specie. This "colonial system" was most thoroughly applied by Spain and Portugal, with the effect of checking their own development, by withdrawing their capital, as well as hampering the progress of their colonies. In England it originated under Cromwell, but was far less thoroughly applied than abroad. Still, the usual relation of official England to the colonies in the 18th century may be illustrated by the story of the English statesman who, being asked to appoint chaplains for the good of the souls of the colonists, cursed their souls and bid them grow tobacco.

The rising in Canada (q.v.) in 1837 made it necessary to concede responsible government to it. Victoria was the first Australian colony to receive a like privilege (in 1857). At present there are three classes of English colony:—Crown colonies, which are governed from the Colonial Office, colonies with representative institutions but not responsible government, in which the Home Government has a veto on legislation, and colonies with responsible government, like Canada, between which and the mother country the Governor-General is practically the only political link. (For the various English colonies *see* separate headings.)

Of foreign nations, only France, Portugal, and Holland now possess important colonies. Denmark has Iceland, a few settlements in Greenland, and some small West Indian islands; Germany has the Cameroons, and possessions in E. and S.W. Africa; Portugal holds Goa, Macao, the Cape Verde

Islands, and settlements on the coast of East and West Africa, Holland has Java, Sumatra, and other East Indian islands, Surinam, and some islands off the coast of Venezuela; France has part of Guiana, and also possessions in India, Cochin China, West Africa, and Oceania, besides protectorates in Madagascar, Tunis, Annam, etc. (Algeria does not rank as a colony). The area and population of these colonies are approximately as under (excluding protectorates and spheres of influence):—

	Area—sq. miles.	Population.
Colonies of France ...	1,574,000	40,000,000
" Holland ...	766,000	30,000,000
" Germany ...	1,064,440	13,726,000
" Portugal ...	866,000	8,800,000
" Denmark ...	87,000	116,000
British Colonies (excluding India) ...	7,360,000	21,000,000

British India, with its 210 millions of population and more than a million square miles of area, has more right to be considered a colony than most foreign colonies so-called.

The French colonies are represented in the legislature; the colonies of other countries are governed much like the British Crown colonies.

The doctrine of the 18th century, that colonies should serve as markets for home produce, still governs the colonial policy of most foreign countries, owing to the prevalence of Protectionism.

Colonisation on a great scale has seldom been carried out on any scientific system. Prof. Seeley has remarked that the English people seem almost to have picked up their colonial empire in a fit of absence of mind. Mr. E. G. Wakefield some sixty years ago suggested that care should be taken to send out artisans as well as agriculturists to Australia, that the various classes of producers might exchange their wares and so stimulate production. His advice was followed in "assisted emigration," which has, however, now been generally discontinued.

Colophon, a city of Asia Minor founded by the Ionians, a few miles N. of Ephesus. Hardly any traces of it are left, but its name has become proverbial, and is used in bibliography to denote the finishing touch of, or final ornament to, a work. It is doubtful whether the proverb, and so the bibliographical use of the word, arose from the fact of the Colophonian cavalry having put an end to a battle by a decisive charge, or from the fact of their having the casting vote in the Ionian assembly. The French word *colophane* for *resin* is derived from the town, as the pines of the neighbourhood were renowned for their resin.

Colorado, one of the United States of America, lying between lat. 37° and 41° N., and long. 102° and 109° W., 380 miles long by 280 miles broad, with an area of about 106,500 sq. miles, having Wyoming and Nebraska on the N., New Mexico on the S., Kansas on the E., and Utah on the W. It takes its name from the Colorado, which drains the western part, while the eastern part is drained by the Arkansas, and the southern by the Rio Grande del Norte. The Rocky Mountains pass through the State from N. to S., the principal range being the

Salwatch Range, which rises in Mount Harvard to 14,400 feet, and has an average height of over 13,000 feet. The Elk mountains diverge from this range about 30 miles in a S.W. direction. The displacement of strata makes the whole region one of much geological interest. There are immense fertile valleys interspersed among the heights, the largest of the four principal ones being San Luis Park, with an area of 9,400 sq. miles. These "parks" appear to have been lakes or inland seas. There are several lofty passes through the range, and railways are carried through some of them and give plenty of scope for engineering ability. The hot springs and dry air of Colorado make it a famous health resort. The mountains were formerly well-covered with forest, but reckless waste has now well-nigh denuded them. The lower lands are eminently fitted for agriculture wherever water is plentiful, and the flour of Colorado enjoys a great reputation, while the upland grasses produce an excellent fodder. The state is also noted for its abundance of flowers. The crops suffer from the attacks of the locust, and the potato from the attacks of the Colorado beetle. The Indian tribes had this district almost to themselves till the discovery of gold in 1858, when emigration set in, and in 1861 Colorado was organised as a territory, and it became a state in 1877. Emigration received a check during the Civil war, as well from that cause as from an Indian rising, but since then it has flowed on without intermission. Much gold is produced and more silver, and since the discovery of fairly good coal in the state smelting and steel founding have made great progress. There are petroleum wells in the state. The principal towns are Denver, Leadville, and Pueblo, the first of which is the capital.

Colorado River (1) rises in the Rocky Mountains, and after a course of about 2,000 miles falls into the Gulf of California. The main stream—the Green river—rises in Wyoming, and after receiving the Bear and White rivers is joined about 150 miles from its source by the Colorado river. The next important tributary is the Little Colorado river, which rises in New Mexico, after receiving the Cimarron river. The Colorado flows through the Grand Canyon, which is a deep and narrow gorge, and receives the Gila river at the junction. A few miles further on it receives the sea. The Colorado is a very rapid river, and one—the Grand Canyon—is about 200 miles long, with cliffs rising to a height of 2,000 feet in height, and the river is very deep, having a length of 12,000 feet. The Colorado was discovered by Alasco in 1540, and was first explored by the Spaniards in 1598. It is about 100 miles above the mouth of the Colorado, and is a very little navigable.

Colours are the various shades of light, or, described as the various shades of light. Xenophon, in his *Anabasis*, describes the colours of the sky, and says, "The colours of the sky are blue, white, and black, and sometimes red."

an extensive dyeing and woollen trade. It appears to have decayed, and to have completely disappeared during the Dark Ages, but excavations have brought to light the former city.

Colossians, THE EPISTLE TO THE, is an Epistle written by St. Paul to the church at Colossæ in Phrygia, probably towards the end of the apostle's first imprisonment at Rome, along with the Epistles to the Ephesians and Philipians. Its object was to caution the recipients against false teachers, whose ritual observances were akin to those of the Essenes (q.v.), and who held a doctrine of angel-worship like that afterwards developed by the early Gnostics. The rest of the Epistle resembles that to the Ephesians. The Epistle is referred to by Justin Martyr, and quoted by Irenæus, Clement of Alexandria, and Tertullian. Some German critics like Baur and Pfleiderer, the latter of whom regards most of the Pauline epistles as post-Pauline pamphlets in that controversy between the supporters of Jewish ritual and those of spiritual Christian worship, the opening of which is referred to in Acts xv. and Galatians ii., regard it as a forgery, belonging to the end of the first or beginning of the second century.

Colossus (Gk. *a statue*), often applied in Greek to gigantic statues like those in Egypt. In the Macedonian period especially, colossal statues were erected in various parts of Greece. The best known was the Colossus of Rhodes, a bronze statue of Apollo by Chares of Lindos, 70 cubits or about 107 feet high. There is no foundation for the view that it was placed astride of the entrance to the harbour. A winding staircase led to the top. It took twelve years to set up, was hollow, and steadied with pillars of stone. Erected about 280 B.C., it was upset by an earthquake thirty-five years later, and lay on the ground till the middle of the 7th century A.D., when it was sold by a Mohammedan general to a Jew as old metal. The statues of Athene on the Acropolis at Athens and of Zeus Olympius, some 40 feet high, were hardly of colossal dimensions. In modern times the great statue of Hercules at Cassel, the statue of Arminius at Detmold, that of St. Carlo Borromeo (1697) at Arona on the Lago Maggiore (70 feet high on a 42-foot pedestal), and that of Liberty by Bartholdi on an island in New York Bay, are the most important colossal statues.

Colour is a special property possessed by ether-waves, whose wave-lengths and vibration-frequencies lie between certain approximately fixed limits. We are able to recognise in various ways and by other senses than that of sight ether-waves of widely different wave-lengths, but those with the property of colour, which can be readily recognised by this special sense of vision, have wave-lengths between $\frac{1}{10000}$ and $\frac{1}{5000}$ of a centimetre. It must not be supposed that such waves possess no other properties recognisable by our senses; they may exhibit in different degrees heating, chemical, and, perhaps, other effects. But we find that those waves with greatest intensity of colour are distinct from those with greatest intensity of heat or of chemical effect.

A *pure* colour, giving monochromatic light, is that produced by vibrations of one definite frequency or wave-length; combinations of such waves will give us any other colours. The following table gives the more conspicuous pure colours, with their frequencies or number of vibrations per second:—

Red	402.4	} billions per second.
Orange-red	..	..	484.1
Orange	..	..	508.3
Orange-yellow	..	..	511.2
Yellow	..	..	517.5
Green	..	..	570.0
Blue-green	..	..	591.4
Cyan-blue	..	..	606.0
Blue	..	..	685.2
Violet-blue	..	..	685.8
Puce-violet	..	..	740.5

Black is the absence of colour; white is a mixture of colours of all wave-lengths from the red to the ultra-violet. By prism or otherwise such white light may be resolved into its constituents, the properties of each of which may be investigated separately. [SPECTRUM ANALYSIS.] White-heat means that a body has been raised to such a temperature that its particles are vibrating with all the varying frequencies capable of combining to form white light; the red-heat stage occurs long before, corresponding to a lower temperature and lower frequencies.

White may also be produced by mixture of two colours, such as yellow and ultramarine; such pairs of colours which combine to give white light are called *complementary*. The term *supplementary* has recently been given to colours which combine to give any definite colour. The effect of combining pigments generally depends on some common constituent that they may both possess. Thus pure ultramarine and yellow give white light, but the ordinary ultramarine and yellow pigments combine to give green. For both the pigments are impure and possess green, their combination thus giving a mixture of white and green.

Opaque substances may not reflect all the colours that fall on them, absorbing some and reflecting others. Thus, the colour of gold is due to the fact that it reflects back only the yellow. If no yellow existed in the light by which it is viewed, the gold would appear black. If we look through a transparent substance, its colour will be that which has passed through without being absorbed. If it contain foreign particles, just as the air contains dust, etc., we may see that colour which is reflected from these particles without subsequent absorption.

The structure of the organs of vision need not here be described, but in regard to the distinction of colour by the normal human eye, it is generally understood that the *retina*, upon which the light falls and over which is spread the nervous matter connected with the optic nerve, possesses three distinct kinds of nerve-elements. Each of these will respond most readily to colour-waves of one definite wave-length, that is to say, there are three physiologically primary colours that are most readily distinguished by the normal eye. Physicists differ as to what these colours are, but, roughly speaking, they are the red, green, and blue. Each

of these taxes only one type of nerve-ending; combinations of them will affect more than one type. It is probable that, just as a tuning-fork will respond to notes not quite of the same pitch as it itself gives, so will the nerve-ends respond to some extent to colours not exactly of the frequency they most readily take up. And further, just as a tuning-fork persists in vibrating after the note has died away that induced it to vibrate, so the sensation of light lasts for a short space of time after the cause is removed. This is the phenomenon of *persistence of vision*.

Imperfection in the response of one type of nerve-element has the effect of rendering that colour partially or wholly invisible to the eye; if it existed alone, the eye would not be aware of any colour; if in combination, the eye could only respond to the other constituents of the compound colour. Such a defect is termed *colour blindness*, dichroic if one primary colour cannot be distinguished, monochroic if two cannot be. This defect obviously involves the inability to distinguish between colours that differ only in possessing in different quantity the unrecognisable primary as a constituent.

Colour Blindness, an inability to distinguish between certain colours exists in some persons. John Dalton, the distinguished chemist, was afflicted in this way, and he, by a description of the differences which he found to exist between his colour judgments and those of ordinary persons, first directed the attention of scientific men to the subject. For this reason colour blindness is sometimes termed Daltonism. The examination of a large number of individuals has shown that some form of colour blindness is present in about 4 per cent. of the male population of civilised countries. Curiously enough, such a defect is very much more rarely met with in women. Attempts have been made to reconcile the phenomena of colour blindness with one or other of the theories of colour vision. [COLOUR.] There are alike difficulties, however, in applying either the Young-Helmholtz hypothesis or the theory of Hering to the actual mistakes observable in colour-blind persons, and the question must be regarded as still *sub judice*. The most commonly noticeable defect in the subjects of colour blindness is an inability to distinguish between red and green, and as these are the two colours most employed for signalling purposes, the practical importance of instituting some adequate test of normal colour vision is very great. The matter is by no means so simple as would at first sight appear. A colour-blind person will often succeed in correctly naming a series of colours, and in many instances he may be quite unaware that his colour perceptions differ in any way from those of the majority of mankind; indeed, in some of the more slightly marked cases of colour blindness it is only by a most carefully conducted examination that the abnormality can be demonstrated. On the other hand, it is a familiar occurrence for an uneducated person to be hopelessly at fault in naming colours, quite apart from any actual defect of the nature of colour blindness. A very useful

test was devised by Holmgren, and the sets of coloured skeins of wool introduced by him are largely employed by ophthalmic surgeons in this country. Briefly, the examination is conducted as follows: A test skein is handed to the patient, and he is requested to match it from a number of other skeins. A normal eye has no difficulty in separating the wools of the same colour as the test skein from the rest, which are known as the "confusion colours." A colour-blind person, on the other hand, matches one or more of the confusion skeins with the test skein. Unfortunately, the methods adopted for the exclusion of colour-blind employes by railway companies and ship-owners are very rough and ready; it is only within very recent times, however, that the desirability of conducting any examination at all has been recognised, and doubtless more and more attention will be devoted to the matter now that its importance is so well established.

Colour Sergeant, the chief non-commissioned officer in a company of British infantry. The colour-sergeants formerly guarded the colours and the officers who carried them; their chief duty is now to act as the channel by which the captain communicates with his men. The corresponding rank in the cavalry is troop sergeant-major (corporal of horse in the Life and Horse Guards).

Colours have, with few exceptions, always been carried to designate separate regiments or corps. The exceptions are the Artillery, the Engineers, and the Rifle Regiments, Hussars, Lancers, and Yeomanry. Formerly every company or squadron had a colour, and this was afterwards reduced to two, one of which was square, the other swallow-tailed. These are now reduced to one in the cavalry and two in the infantry. In the cavalry the "standard" of Dragoon Guards is of crimson silk and square, and bears the Royal title, the number, and other details; the "guidon" of Dragoons is of crimson silk, but is swallow tailed in form. The colours of infantry are of silk—the "Royal" or first colour is the "Great Union" flag with the crosses of St. George, St. Andrew, and St. Patrick combined, and bears in the centre the name of the regiment, crowned with a crown. The second colour is of the same material and colour, except when the latter is blue, in which case the colour is to be the same as the first, but white field, and bears the name of the regiment, and mottoes which are given by the royal authority. They are carried by the junior lieutenants (on the right hand) and the standards and guidons are carried by the senior major. Colours are too large to be carried by a single rifleman, and are therefore carried by a colour-bearer. The "p" is the name of the colour-bearer, conducted by the colour-bearer, and the colour-bearer is usually deposited in the hands of the colour-bearer.

Colours are also used in the Church to mark the seasons of the year, and the sets of colours used in the Church are the same as those used in the Church.

The Roman sequence is—White, on the chief festivals and from Easter to Whitsuntide; red, in Whitsun week and on days of martyrs; violet, in Lent and Advent and on vigils and rogation days; and green on all other Sundays and weekdays. The Sarum use is—White, on certain principal festivals; red, on other Sundays and saints' days; yellow, on feasts of confessors; black, on All Souls' Day and at funerals. Green and blue were sometimes used for festivals, and ash colour for Advent and Lent. The Gallican use resembled that of Sarum.

Colours, HERALDIC. In heraldic art the colours are divided into three classes, *metals*, *tinctures*, and *furs*. There are two metals, silver and gold, known respectively as "argent" and "or." The latter is occasionally represented by yellow, the former nearly always by an untouched surface or by white. When represented in line-engraving argent is left plain, but the surface is covered with small dots placed at regular intervals to denote "or." Heraldry knows no other metals. The tinctures in regular use are "gules" or red, "azure" or blue, "sable" or black, "vert" or green, and "purpure" or purple. The first is represented by perpendicular lines set evenly and closely together, the second similarly by horizontal lines, and the third by perpendicular and horizontal lines crossing each other at right angles. Vert lines run downwards from left to right (which, it must be remembered, are the exact opposite of the dexter and sinister of armoury), at an angle of about 45 degrees, and to denote purpure these lines are drawn from right to left. Two other colours, tenné (orange) and murray (a dark red), are mentioned by some writers. They are very seldom met with, and are not usually considered as tinctures. There are ten sorts of fur, but of these some are never now used, except in remote instances. The most common, of course, is "ermine," which is a white ground with black ermine spots. "Erminois" only differs in having a gold ground. "Ermines" has a black ground with white spots, and "pean" is the same but with gold spots. "Erminites" is similar to ermine, but having a red hair on each side of the black spots. "Vair" is depicted as composed of small shield-shaped pieces fitted into each other, alternately blue and white placed top to top and point to point. If the colours are not argent and or, the field is said to be "vairé" of whatever tinctures it may happen to be; "counter-vair," and "vair-en-point," which are very seldom met with, are varieties of vair, the small pieces in these being arranged somewhat differently. Potent and "potent counter-potent" are furs very similar to vair and vair-en-point, but having the small pieces of which it is composed each shaped as a T. When any charge is painted in its natural colours it is termed "proper."

Colours, VEGETABLE, fall into four classes—(i) those in the cell-walls of bark; (ii) those in woods, as in logwood; (iii) those dissolved in cell-sap, as in the blues, violets, and some reds in flowers; and (iv) those connected with protoplasmic granules, such as chlorophyll (q.v.), etiolin, xanthophyll, anthoxanthin, phycoxanthin, and

phycoerythrin. Those of the three first-named classes are probably derivatives of tannin (q.v.). *Etiolin*, a pale yellow, seems to be an antecedent or constituent of chlorophyll. *Xanthophyll* in fading leaves, and *anthoxanthin* in yellow flowers, seem to be derivatives of chlorophyll, probably degradation-products. *Phycoxanthin* and *phycoerythrin*, characteristic of the olive and of the red sea-weeds respectively, are more soluble substances. The chemistry of these substances is almost unknown, nor is there any evidence of their having in many cases acquired a physiological importance beyond that of mere excreta. It is otherwise with colours in the floral region. Colours occurring here fall into two series: the *cyanic*, blue, violet, and red in solution, and the *xanthic*, yellow, orange, and red in chromoplastids. The two series seldom co-exist in one flower. Many large groups of plants have a limited colour-range, e.g. the *Umbelliferae*, nearly all white- or yellow-flowered; the *Cruciferae*, the same, with a few reds; the *Caryophyllaceae*, mostly red and white. Colour and perfume are frequently correlated, many white flowers being sweet-scented, especially in the evening; whilst many brownish flowers have a scent of carrion. This seems to be a close adaptation to cross-pollination by dusk-flying moths in the one case, and by carrion-flies in the other. Wasps seem partial to orange flowers, and humming-birds to red ones. A connection of predominating flower-colours with latitude—reds being most tropical, blues less so, and yellows and whites more polar—coupled with the opening of flowers in spring and summer in order of colour—blues on an average first, then whites, purples, yellows, reds—suggests a close connection between floral colour and the intensity of the sun's light. The whole subject has, however, been the theme of more hasty guesses than sober investigations.

Colquhoun, JOHN (1805–1885), a noted Scottish sportsman and writer on sport, born and educated in Edinburgh. Among his writings are *Moor and Loch*, *Rocks and Rivers*, *Salmon Casts and Stray Shots*, and *Sporting Days*.

Colquhoun, PATRICK (1745–1820), a London police magistrate, born in Scotland where he was Provost of Glasgow in 1782. As a London magistrate he was very active in advancing social reforms, and wrote a great deal on such subjects. Among his works are *Police of the Metropolis*, and *Population, Wealth, Power, and Resources of the British Empire*.

Colt, SAMUEL (1814–1862), an American, noted as the inventor of the revolving pistol. He was born at Hartford, Connecticut, and as a boy ran away from his father's silk factory and went to sea for one voyage, during which he made a model of his pistol. On his return he learnt chemistry and lectured upon it for two years in order to raise money to carry out his invention. The first effort proved a commercial failure, but in 1847 the government ordered 1,000 for the Mexican War, and the general adoption of the patent throughout the world made the venture a thorough success.

Coltsfoot (*Tussilago Farfara*), the only British species of a small genus of composite plants, is a common and often troublesome weed on clay, or even on bare chalk. Its flowering scapes, with yellow flowers and imbricate bracts along the peduncle, appear very early in spring, and are followed by a large pappus and by the broad angular leaves which are cottony below. This cotton, soaked in saltpetre, was formerly used as tinder. The leaves are used as a remedy for coughs and asthma, either smoked or infused, *tussilago* meaning "cough-allayer." The leaves are often spotted with orange patches of a pretty little fungus, the coltsfoot cluster-cup, *Æcidium tussilaginis*.

Coluber, a Linnaean genus of snakes, which included the venomous and non-venomous Colubrine Snakes. [SNAKES.] It is now greatly restricted and is the type of a universally distributed family (Colubridæ), to which the English Ringed Snake (q.v.) belongs. The best known species of the genus is the Æsculapian or Schlangenhaut Snake (*C. æsculapii*), widely distributed in Europe.

Columba, ST. (521–597), is thought to have been born in Donegal of a family of Irish royal blood. He was ordained and took monastic vows, and founded two monasteries in Ireland, one on Lough Foyle, the other in Leinster, known later as Derry and Durrow respectively. Somewhere about 560 he went on a mission to Scotland, and King Conal, his kinsman, gave him the island of Iona, where he built a church and monastery, and made preparations for the conversion of the Picts. Beginning with Ness, the King of the Picts, he soon succeeded in converting all north Scotland, and founded many monasteries, the whole of the northern Picts paying ecclesiastical obedience to the Abbey of Iona. The Scots of Britain and Ireland honoured St. Columba as much as did the Picts, and it was he that crowned Conal's successor Aidan as king. He also accompanied the king to Ireland in 590 when a council was held in Ulster to settle a dispute between the King of Ireland and the King of the Scots. When he felt death approaching he went to a hill above the monastery to give it his farewell blessing, and then returned to his cell to go on with the transcription of the Psalter, the last words he wrote being, "They that seek the Lord shall want no manner of thing that is good." At the midnight service of the next day—Sunday—he sank down before the altar and quietly died.

Columban, ST. (Columbanus) [550–615], an Irish monk of Leinster, who was educated at Bangor in Down. In 590 he went with others to the Vosges and founded the monasteries of Luxeuil and Fontenay. He was accused before a synod of French bishops in 602 for unorthodox practices as to the keeping of Easter, and having given offence at Court by rebuking Thierry II. of Burgundy and Brunehart, he was banished, and preached for a time in Switzerland. Driven from there he went to Italy, where he founded at Bobbio the monastery in which he died. He appears to have been acquainted

with the Latin and Greek classics, and among his writings are some Latin poems. His works were published at Louvain (1667).

Columbia, a name of widespread use in the United States of America. 1. The chief is the District of Columbia, the seat of the Federal Government. This was made the seat of government under a law of Congress in July, 1790, and consists of a district of 64 square miles at the junction of the Potomac and Rock Creek, one of its affluents. It is well wooded and has some delightful scenery, and is very productive of grain and vegetables. The capital is Washington, which contains the Capitol, and has been the seat of the central government since 1800. The United States navy yard here is one of the best appointed dockyards of the country. The territory is under the control of Congress, and municipal affairs are administered by commissioners appointed by the President and Senate. The district has no elective franchise, and consequently no representative in Congress. Another important town is Georgetown, which is connected with Cumberland in Maryland by the Chesapeake and Ohio Canal. There are two universities and many schools and churches in the district. 2. The capital of South Carolina, of which it is the chief seaport, on the E. bank of the Congaree, 124 miles N.W. of Charleston, to which, in other respects than political, it ranks as second. It was almost destroyed during the Civil war.

Columbia, BRITISH, a mountainous district of North-West America, forming, with Vancouver Island and Queen Charlotte's Islands, since 1871 a province of the Dominion of Canada. It lies between the 60th parallel of N. latitude and the United States on the south, and between the Rocky Mountains on the east and the Pacific on the west. The country is chiefly occupied by forest-clad spurs of the Rocky Mountains, which develop in the west into the Cascade Range, interspersed with fertile valleys which are more fitted for pasturage than for conversion into arable land. Till comparatively lately the country was little known, save to the men of the Hudson's Bay Company, but the discovery of gold led to the immigration, and led to the development of the possibilities of the district. Since the opening of the trans-continental Canadian railway, the Columbia bids fair to become a great trading centre between Canada and Australia. The country is great, though a small amount of coal has been found. The discovery of gold on Vancouver's Island has been little interfered with, and will probably become a great source of wealth. Yet worked has been especially along the coast. The importance of the district is shown by the fact that in 1880 it contained 800 miles of coast, and 1,000 miles of inland water. The principal heights are the Coast Range, the Columbia Range, and the Coast Range.

which average 16,000 feet. Fish is abundant on the coast and in the rivers, and much salmon-tinning is carried on. Esquimault on Vancouver Island is the chief station of the Pacific squadron, and possesses repairing docks.

Columbia College, New York City, was founded in 1754 under the name of King's College by the Crown, on the model of a college at one of the English universities, already introduced at Harvard (q.v.) and Yale. The name was changed at the Revolution. It is now a university granting degrees under a charter from the State legislature, and is governed by a board of trustees elected by cooptation. It is not residential, but (like University College, London) provides instruction only, many students living at their own homes. It is one of the richest of American universities, having valuable landed estates in New York City. Important offshoots from it are the "School of Mines," an important technical school of applied science, and the School of Political Science, whose organ, the *Political Science Quarterly*, contains matter of much value. Anthon (q.v.) was for many years a professor, but it has since numbered scholars and scientific men of greater eminence on its staff, among them the authors of the Latin dictionary most esteemed in England at present.

Columbia River rises on the western slope of the Rocky Mountains in British Columbia, and, after flowing with an irregular, generally south-west course, flows west and then north-west, forming for some distance the boundary between Oregon and Washington states, falls into the Pacific, having Pacific City in Washington on the north side of the estuary, and Astoria in Oregon, on the south. Its bar and many rapids render navigation difficult, though these difficulties in some measure are surmounted by the means of short railways which make the *portage*. The Columbia is chiefly noted for the abundance of its salmon, which are largely tinned and exported.

Columbidæ. [DOVE, PIGEON.]

Columbine (*Aquilegia*), a beautiful genus of *Ranunculaceæ*, natives of the north temperate zone. They have elegant bi-ternate or tri-ternate leaves and drooping polysymmetric flowers with five petaloid sepals, five petals, each with a long spur, indefinite stamens, and five carpels forming a ring of follicles. In the one British species, *A. vulgaris*, the spurs being incurved have been compared to five doves' heads, the sepals being their wings, whence the name Columbine. In cultivation, the flowers vary much in colour, and are often doubled. Several American species and hybrids are now grown with very long spurs and beautifully contrasting colours in the calyx and corolla.

Columbine (Ital. *dove-like*), in the popular improvised comedy or *commedia dell'arte* of Italy [COMEDY], is the ladylove of harlequin, who is usually kept from him by fate or her cruel father (pantaloen). This comedy is the origin of the harlequinade of the English pantomime. Both harlequin and columbine in the latter are chiefly remarkable for their dancing.

Columbite (also called *Niobite*), a rare mineral consisting of oxides of iron, tantalum, and niobium, which occurs in but few localities. It is of an iron-grey colour, of sp. gr. about 6, and crystallises in the rhombic system.

Columbium. [TANTALUM.]

Columbus, in Franklin county, is the capital of the state of Ohio in the United States of America, and is on the Scioto, a tributary of the Ohio, 100 miles N.E. of Cincinnati. Its situation in an extensive plain is very pleasant, and its broad tree-shaded streets are well laid out. There are many fine public buildings, among them the Capitol, with a rotunda 150 feet high. The manufactures are various and numerous, but of no great special interest. Columbus is well provided with railways, and is served by a branch of the Ohio Canal.

Columbus, CHRISTOPHER (1436-1506), a Genoese navigator, who is generally credited with the discovery of America. His father was a woolcomber, but the son went to sea at the age of fourteen, and led a somewhat adventurous life, taking part in sea-fights, and eventually arriving in Portugal, where he married the daughter of an Italian navigator. Here he studied the maps and charts of his father-in-law, and seems to have let his mind dwell upon the romantic stories then afloat of wondrous lands to be found out in the western seas. He travelled to the north as far as Iceland, and there he may have heard the stories of Norse adventurers, who had discovered lands to the west. However this may be, he had in 1474 formed the design of discovering a western passage to India, and cast around for someone to patronise and pay for the venture. For some time he did this in vain. Kings and nobles alike held aloof, and when he finally applied to Ferdinand and Isabella he was for a time unsuccessful, partly owing to the preoccupation of the king and queen, who were in the middle of the war with the Moors, and partly to Spanish jealousy. It was not till 1492 that he finally was able to set sail in the *Santa Maria*, accompanied by the smaller ships *Pinta* and *Niña*. On September 26th he started from the Canary Islands, and the trouble he encountered owing to the ignorance, superstition, and timidity of his crews, is matter of universal knowledge. On the 11th of October he saw a light ahead, and on the next day made one of the Bahamas, going on to Cuba and Hispaniola (now Hayti), where the *Santa Maria* ran aground and was lost. In September, 1493, the two remaining ships arrived on the same day in port, though they had lost sight of each other a month before. They brought back specimens of the productions of the newly-discovered lands in the shape of gold, plants, birds, animals, and six natives. Columbus was received with honour, being made Admiral of the Sea, and Grandee of Spain. In the autumn of the same year he set out upon his second voyage, in the course of which he discovered Dominica, and made an effort at colonising. But though a good and bold sailor, he was a poor coloniser, and a bad commander of men. He was much aided by his

plucky brother Bartholomew. He returned to Spain in 1496, and incurred the anger of the queen for having enslaved the natives. In this respect he was no worse than Sir John Hawkins and other English adventurers of a later date. In 1498 he made his third voyage in which he penetrated to the mainland. Meantime the jealousy of the Spaniards had made head against him, and through an overstraining of the royal commands, the governor of the colony sent the two brothers Columbus home in chains. The queen at once released the brothers, and received them back into favour, but the indignity had sunk into Christopher's heart, as he bitterly spoke of "the rewards of service," and he was never the same man again. In 1502-4 he made another voyage of exploration along the south coast of the Gulf of Mexico, and endured much hardship. He died at Valladolid in 1506. His remains were afterwards moved to Seville, and then, along with those of his son Diego, to Hispaniola, to be once again, at a much later date when Hayti became French, moved to Havana. Besides his brother Bartholomew, and his eldest son Diego, both of them men of mark, there was a brother Giacomo. Columbus seems to have been a curious mixture of enthusiastic dreamer and practical man, of almost ascetic devotee and intrepid mariner, a type not so rare, perhaps, then as now.

Columella, L. JUNIUS MODERATUS, a first-century Roman writer upon agriculture, being the contemporary of Seneca. He travelled much, and seems to have visited Gades, Tarentum, and Sardinia, but chiefly resided at Rome. He wrote twelve books *De Re Rusticâ*, one, in dactylic hexameters, being chiefly upon gardening. He also wrote a supplementary treatise upon trees—*De Arboribus*. The best edition of his works is that of Leipzig (1794-97).

Column, in architecture, a rounded pillar with a base, shaft, and capital (q.v.). Occasionally a column stands alone as a monument (as in the Nelson column in Trafalgar Square), or is a purely ornamental adjunct to a building (as in the Taylorian Institution at Oxford). In Gothic and Norman architecture a column usually supports one side of an arch, in classic architecture the entablature (q.v.). In military language, the column is the formation of the army when marching or manœuvring.

Colvin, SIDNEY, born at Norwood in 1845. He entered at Trinity College, Cambridge, where he gained the Chancellor's Medal for English verse, and graduated as third classic, and became Fellow in 1869. In 1873 he was appointed Slade professor of Fine Arts, and became director of the Fitzwilliam Museum in 1876. In 1884 he was appointed Keeper of Prints and Drawings at the British Museum. He has written a good deal, among his works being *Lives of Landor and Keats* for the *English Men of Letters* series.

Colza (*Brassica campestris oleifera*), a variety of the rape, grown for the sake of the oil expressed from its seeds, chiefly in France, Germany, Russia, and India. Colza oil was formerly largely used in

lamps, but is now superseded to a great extent by the cheaper petroleum oils.

Coma (Gk. *kōma*, deep sleep), is a condition of unconsciousness occurring in certain forms of disease, which differs from sleep in that the patient cannot be aroused. In the slighter forms of coma the phenomena are closely allied to those of sleep; signs of deepening coma are the development of stertorous breathing, with puffing of the cheeks, the involuntary passage of the evacuations, and impairment of reflex movements. Death, if it occurs, is usually preceded by marked changes in the character of the pulse and respiratory movements, in some instances by considerable rise of temperature. Coma may supervene upon injuries to the brain produced by violence, or resulting from disease within the cranium. The sudden onset of coma usually points to a vascular lesion. [APOPLEXY.] Epilepsy is one of the most common causes of the development of the comatose condition. Again, coma may occur in fevers, and may be produced by certain narcotic poisons (especially opium (q.v.) and alcohol), or by the accumulation of morbid poisons within the animal body, as in the condition known as uræmia, or in diabetes. The diagnosis of the cause of coma is oftentimes fraught with extreme difficulty. In many instances the most carefully conducted examination of the patient fails to warrant any definite conclusion, and time alone can be expected to reveal the cause of the mischief. There may be evidence of some head injury, or poisoning may be suspected, in which case the stomach pump must be employed; the existence of paralysis [HEMIPLEGIA] may throw light on the matter, and the ophthalmoscope and stethoscope, and in some instances an examination of the urine, may clear up the diagnosis. The greatest caution, however, is necessary in drawing conclusions, even in cases where any data can be discovered to start from. The treatment of coma depends mainly upon its cause, and is, therefore, beyond the scope of the present art.

Comacchio, a town in Italy, 37 miles S.E. of Ferrara, on the coast of the Adriatic, east of a lagoon, 10 miles out from the Adriatic, 10 miles wide. It is the seat of several churches, and a number of industries are said to be carried on. The chief industries are said to be the fry of eels and grey mullets, and kept in by nets. Tass. The fish of Comacchio.

Com. a wide fertile level, 1900 ft. It was formed from the bottom of the sea, and was the

coloured, and more fully developed.

Comb. The shape of the comb is probably suggested by that of the backbone and projecting ribs of the fish, which was probably the first tool which supplemented the primitive use of the fingers in dressing the hair. Combs were used by the ancient Assyrians and Egyptians, those of the latter being of wood and toothed on one side only. The Greek combs were toothed on both sides and made of boxwood from the shores of the Euxine. In shape they resembled the modern fine-tooth comb. Ivory combs were also used both in Egypt and in Greece. Valuable combs ornamented with jewels are preserved from Byzantine and mediæval times. Many of them are in the treasuries of Continental churches, and were intended for use by the priests before saying mass. High "back combs" have at times been an important feature in feminine attire. They reached their highest altitude some sixty years ago in France, when the towering back hair surmounted by a high ornamented comb was known as the *peigne à la giraffe*. Modern combs are made of boxwood, tortoiseshell (or rather turtleshell from the Pacific), horn, ivory; the guttapercha comb (made in a mould) was invented by Goodyear, an American, about 1850; more recently combs have also been moulded from celluloid (q.v.).

Combassou, a dealers' name for the ultramarine or steel finch (*Fringilla ultramarina*). The males in full plumage are blue-black with metallic lustre.

Combe, ANDREW (1797-1847), M.D., physician and physiologist, born at Edinburgh, where he studied medicine, going afterwards to Paris to study in the medical schools there. In 1823 he practised in Edinburgh, but weak health proved a formidable obstacle. In 1836 he was appointed physician to the King of the Belgians, and in 1838 physician to Queen Victoria. For his health's sake he made voyages to Madeira and elsewhere, and embodied his views of the ship accommodations of that day in a paper upon *Ship Fever*. Among his other works are *Mental Derangement* (1831); *Physiology* (1834); *Digestion* (1836); *Infancy* (1840).

Combe, GEORGE (1788-1858), brother of the above-mentioned Dr. Combe, was born at Edinburgh, and educated at the High School and University there. He was writer to the Signet from 1812 to 1837, when he devoted himself to phrenology and education. He attended the lectures of Spurzheim, and after being a thorough disbeliever in his principles, became an ardent disciple, and made the condition of man in relation to external objects a special study. He travelled and lectured and established schools for carrying out his ideas. Besides his *Essays on Phrenology* and his *Elements of Phrenology*, he wrote upon social subjects.

Combe, WILLIAM (1741-1823), born at Bristol, is chiefly known as the author of *Dr. Syntax's Tour*, which again owes most of its reputation to the illustrator. Educated at Eton and Oxford, he inherited a small fortune, which he soon dissipated in a life of adventure. He wrote many works which are now little known and less regarded.

Combermere, STAPLETON COTTON, VISCOUNT (1773-1865), was the son of a Cheshire baronet. He was educated at Westminster, and entered the army in 1790. In 1794 he was in India and had become lieutenant-colonel. In 1808 he was in the Peninsula, a major-general, and in 1810 he was commander of the cavalry. He took part in the battle of Talavera and many others; and in 1814 was created Baron Combermere. From 1817-1820 he served in the West Indies, from 1822-25 he was in Ireland, and from 1825-30 in India, where he was present at the taking of Bhurtpore—a siege familiar to readers of that quaint old book *John Ship*. In 1827 he became viscount, and in 1852 succeeded the Duke of Wellington as Lieutenant of the Tower. He was made field-marshal in 1855. He retained a wonderful vigour and activity till extreme old age, owing in a great measure to his abstemiousness and his great power of self-control.

Combinations, in *Mathematics*, the number of different groups of articles that can be selected from a given quantity, each group to differ in its constitution from every other group. Thus it is a question of combinations to discover how many different hands of whist are possible with the ordinary pack of fifty-two cards. [PERMUTATION.]

Combinational Tones. When two notes are sounded together a third note will be faintly heard whose frequency is the sum of the frequencies of the two given notes; this is called the *summational* tone. Also a fourth note will be produced whose frequency is the difference of the frequencies of the two given tones; this is the *differential* tone. Thus c' (256 vibrations per second) and g' (384) give c'' ($= 640 = 256 + 384$). They also give c ($= 128 = 384 - 256$). These two extra notes are called combinational tones.

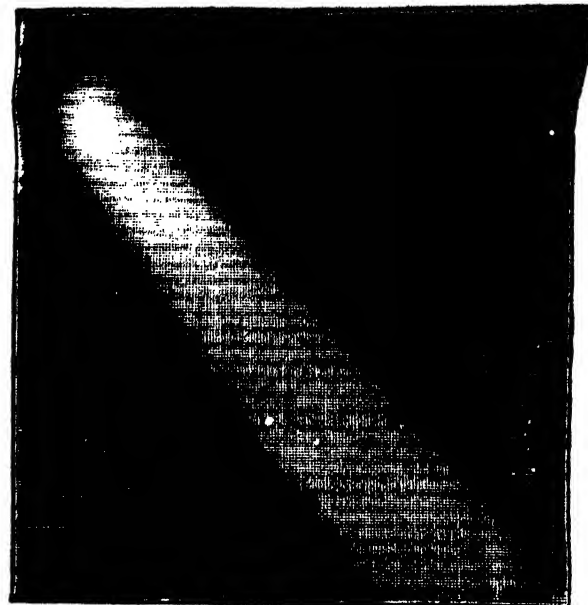
Combustion signifies any chemical reaction in which combination occurs, and which is attended by the production of much heat. Ordinarily, however, the term is restricted to those cases in which the heat evolved is so great as to render the reacting bodies, or products of the reaction, luminous. All cases of *burning* are instances of combustion. In the case of combustion in air the effect is due to combination with the atmospheric oxygen. The early history of chemistry was for the greater part a history of combustion, and the first comprehensive chemical theory was a theory of combustion—the phlogiston theory, enunciated by Stahl. [PHLOGISTON.] Though held by chemists for over sixty years, it was completely demolished at the end of the 18th century by Lavoisier. This eminent French chemist proved the composition of air to be a mixture of the two gases oxygen and nitrogen. He showed that the latter played no active part in the phenomena of burning, the oxygen alone being concerned. He afterwards demonstrated conclusively that the essential nature of the reaction was the combination of the constituents of the burning substance with the oxygen of the air.

Comedy (Greek, literally, *village-song*). Like tragedy (q.v.), comedy arose in connection

with the worship of Dionysos (Bacchus). At the village festivals of Bacchus in early Greece, especially at the vintage, bands of revellers used to stain their faces with the wine-lees and go about jeering and mocking at everyone they met. With excitable, imaginative people like the Greeks, this involved much expressive gesture and impersonation. This spontaneous revelry in course of time acquired a regular plan. We hear of a rudimentary comic drama in Sicily in the 7th and 6th centuries B.C., and somewhat later in Megara (in both these towns there was bitter political feeling between nobles and people, which found expression in their comedy); and in Sicily at Syracuse [EPICHRMUS] about 500 B.C., where, as the existence of a despotism prevented political satire, parodies of the myths and sometimes of the doctrines of philosophers (e.g. the Pythagoreans) seem to have been in vogue. Athens' comedy was originally derived from that of its neighbour Megara. As tragedy (q.v.) developed comedy imitated it, adopting its structure, its metres (to a great extent), and its chorus; and, being especially an amusement of the masses, it grew with the growth of democracy after the Persian wars. Of Crates, Cratinus, and Eupolis (456-420 B.C.) we have only fragments. Our knowledge of the Athenian comedy of this—its first and best—period is derived almost wholly from ARISTOPHANES (q.v.), whose first play was produced in 427, his last in 388 B.C. His attacks are chiefly on the democracy of Athens, the "new learning," and the new subversive notions in philosophy and religion. During the troublous times at the end of the Peloponnesian war political satire was dangerous, and his last play, the *Plutus*, deals with a social subject—the desire for wealth. Moreover, the increasing poverty of Athenian society had made it difficult to mount the plays properly or furnish choruses. [DRAMA.] The example set in the *Plutus* was followed in other plays, which collectively are classed as the Middle Comedy, and seem to have satirised social types rather than persons—the miser, the timid man, the swaggering warrior, and so on. Fragments only are left. Literary education and ethical speculation had probably disposed society for this sort of satire. As political interest decayed in Greece (after Alexander's conquests), this type passed into the New Comedy or Comedy of Manners, of which Menander, imitated by Plautus and Terence in Latin, is the best known writer. A kind of rustic Roman comedy, the *fabula Atellana* (originally written in the Oscan dialect), was probably suggested by Sicilian comedy. The Roman regular comedy of Plautus and Terence was almost a direct translation from the Greek; by its side, however, were the "Atellane fables" and the *mimes*. The latter, probably a purely native institution, are farcical representations, often decidedly broad in character, of some ludicrous incident. They had fixed characters—a clown, a heavy father, "chatterboxes," etc., but the dialogue was largely *extempore*. Probably, while there was little regular comedy written after 100 B.C., representations akin to the *mimes* continued in Italy through the later Roman Empire and the Middle Ages until the Renaissance.



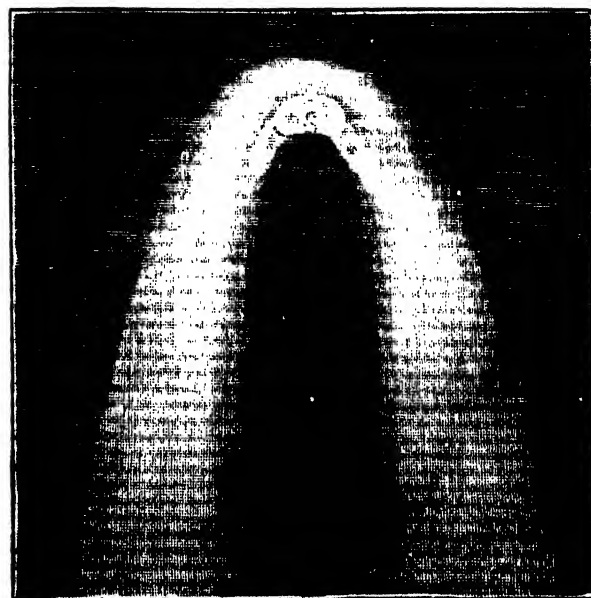
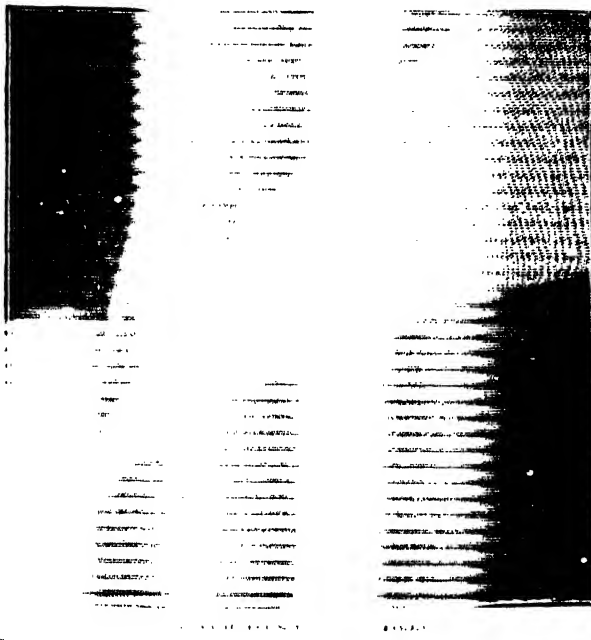
1 The Comet of 1811.



2 Halley's Comet, 1835.



The Great Comet of 1843.



5 The same, seen through a Telescope.

COMETS. NAWAE SALAR JUNG BAHADUR.

"Mimi" and "joculatores" (*jongleurs*, jugglers) are mentioned both in England and abroad by mediæval authors, and the popular *commedia dell'arte* of Italy, with its fixed characters (harlequin, columbine, pantaloone, etc.) and improvised dialogue, the parent of our pantomime, is probably derived from this mediæval comedy. But the comedy proper in modern times begins about the end of the 15th century. Farces were written during the Middle Ages, and a French one (long afterwards revived as *L'Avocat Pâtelin*) was produced in 1490. In Germany, too, there were farcical "carnival plays," of which Hans Sachs is the best known author. But both in Italy and Spain at the Renaissance dramatists began to give to these popular farces the conventional structure and characters of Plautus and Terence. The earliest modern comedy, according to Hallam, is the *Calandra* of Bibbiena, based on a play of Plautus and produced at Venice in 1508. An early Spanish piece is of about the same date. But Ariosto (1474-1533) may be taken as the parent of modern comedy. Two comedies by him in Italian have the conventional Terentian characters, but one has an original plot. It had long been the custom for schoolboys or University students to perform Latin plays on special occasions; and the first English comedy was written for performance by Eton boys by Udall, while headmaster, between 1534 and 1541. In France—somewhat as in ancient Greece—the rude popular farce was first converted into comedy proper by Molière (q.v.) in the seventeenth century, who in his verse comedies combined the humour and licence of the farce with the strict versification introduced for tragedy by Malherbe, and who, like the writers of Middle Comedy of Greece, satirised social types. To trace the evolution of modern comedy in England would require a considerable volume; it passes through under the hands of Ben Jonson and Shakspeare, away from the fixed incidents, conventional characters, and dramatic unities that had come down from ancient Rome, to the refreshing licence and endless variety in all these matters that we find, for instance, in the *Merchant of Venice*; and through the witty but licentious comic drama of the Restoration to the lifelike if somewhat overdone comedy of Goldsmith, Sheridan, and the 18th century. At the end of the 18th and beginning of the 19th century comedy utterly to the serious "comedy of manners" which would-be dramatic reformers of the 19th century can only be distinguished by its want of dramatic unity. It has much more plot; it is more marked by a special predilection for certain incidents; the incidents are ruled by certain characteristics (adapted from the comedy of Ben Jonson) and the definition of the characters is the earliest plan of the comedy.

Comenius was an educationist, a philosopher, a writer, a wanderer, but not a dramatist. He was involved in the controversy of the education, but

the Civil war drew attention to graver matters, and he went to Sweden in 1641 at the invitation of the Chancellor Oxenstiern. He went back to Lissa in 1648, from there to Hungary, and then to Amsterdam, where his books were published (1657). Besides his *Didactica Magna*, *Jamua Linguarum reserata*, *Vestibulum*, he wrote a kind of *Cyclopædia*, and is said to have edited the first *Children's Picture Book*.

Comets form a special class of heavenly bodies remarkable in many ways. They exist in great numbers, though it is only occasionally that they present an appearance to the unaided eye of an observer of the heavens. Records of such appearances are given in history, much fear and anxiety attending them during their short visits. But since more has been learnt of the nature of comets, and especially since the approximate time of the appearance of such a comet as happens to be a periodical visitor has been predicted by astronomers, much of the superstitious dread attaching to them has been removed. For it is the unexpected that alarms people, and comets are now no longer unexpected, though so far as their exact nature is concerned very little is known, and much still remains to be discovered.

The path of motion of a periodic visitor to our solar system is elliptic, the sun lying at one focus of the ellipse, and exerting a sufficient gravitational force on the body to prevent its rushing off never to return. But if the speed of the body could be accelerated when it is at *perihelion* or minimum distance from the sun, the path of motion would be a longer ellipse, and the body would take longer time to complete its orbit; and if the speed were increased to a certain definite degree, the intensity of gravity would be just insufficient to bring the body back to its starting point, the ellipse would extend to infinity, and we should get a parabolic orbit. Such a body, reaching its perihelion with such a speed, would take infinite time to accomplish its orbit, and would only visit our system once, departing then for ever. Further, all bodies with speeds greater than their corresponding critical speeds would describe hyperbolic curves and would similarly visit our system once only.

The orbits of comets afford instances of all three types, elliptic, parabolic, and hyperbolic. In most cases the elliptic orbits of our regular visitors are so gigantic that they are practically parabolic. Comets, whose orbits are hyperbolic, cannot have acquired their speed by reason of the sun's attraction only, otherwise they would describe parabolas. The effect of the attraction of the solar planets upon comets has also to be considered in the investigation of their motions. Perturbations are in this way produced which materially alter a comet's path; the converse perturbations, due to the reciprocal action of the comet upon the planets, are extremely small, and practically produce no effect in the elliptic orbits of the planets, for the mass of the comet is exceedingly small.

Another observed effect is that of the slight retardation of a comet as it rushes round the sun at perihelion. The period of Encke's comet is diminished by $2\frac{1}{2}$ hours on this account each time it

effects a complete circuit round the sun ; it is due apparently to some sort of frictional resistance in the medium surrounding the sun, as though the latter possessed a material envelope of extreme tenuity extending for millions of miles from its surface.

Comets vary considerably in appearance. (See vol. iii. p. 193.) There is generally a bright centre or *nucleus*, surrounded by fainter layers that stretch away into a sweeping tail of varying luminosity, and of such exceeding thinness that the brilliancy of a star when seen through a comet's tail seems unimpaired. It is observed that the tail of a comet, if it possess one, is always directed away from the sun. The mass of a comet is so slight in comparison with that of the heavenly bodies, whose masses we are able to compare and directly estimate, that no satisfactory means have been devised to obtain a numerical value thereof.

It is supposed that the nucleus consists of disconnected meteoric fragments, and that the tail consists of iron or chlorine, hydrocarbons, and hydrogen. Proximity to the sun probably volatilises part of the material available for the tail, and this is dissipated by subsequent visits to the sun till no more material remains to renew that which has frittered away. The comet is then tailless. The light of comets may be due to electric discharges, to reflected solar light, and to incandescence of its ingredients. The repulsion of the tail from the sun seems to demand an electrical explanation. Twenty periodical comets are known, the more important of which are here tabulated :—

Comet.	Period.	First Obs.	Next passage.
Halley	7·6	B.C. 11	1910
Biela	6·6	1772	probably scattered.
Tempel	6·538	1867	1910
Brooks	7·101	1886	1911
Faye	7·390	1843	1911

Besides these there are other comets worthy of notice. The 1811 comet was very brilliant ; it describes an elliptic orbit of enormous dimensions, its maximum distance from the sun being about 40,000 million miles. Views of the great 1843 comet and of Donati's 1858 comet are given in the plate. The former approached dangerously near to the sun ; its minimum distance from that body was only 32,000 miles. Its tail was over 200 million miles in length, and its orbit has since been followed by the 1880 comet. The earth passed through the tail of the great 1861 comet, but without any harm being done by the passage. Very many similar appearances have been observed, and their structure examined by telescope and spectroscope.

Comfrey, the English name of the boraginaceous genus *Symphytum*. They are rough perennial plants, having a cooling taste like borage and scorpioid inflorescences of cylindrico-tubular flowers, cream-coloured, purple, or blue. There are two British waterside species, and a third, *S. peregrinum*, probably a cultivated hybrid between the British *S. officinale* and the Caucasian *S. asperrimum*, has been introduced as a forage-plant under the name Prickly Comfrey. It grows freely, even in stiff clay, and proves a most valuable winter fodder, especially for horses.

Comines, a French town in the department of the Nord and arrondissement of Lille, 15 miles south-west of Courtrai, and upon the river Lys, which forms part of the French and Belgian frontier, and divides the town into two parts, one of which is Belgian. There are some manufactures. The town is the birthplace of Philippe de Comines (q.v.).

Comines, PHILIPPE DE, SIEUR D'ARGENTON, a French statesman and historian of Flemish extraction, and born at Comines in 1445. He went to Burgundy and rose into high favour with the then Duke and his successor, Charles the Bold, with whom his name is more generally associated. He was sent on various missions to France, England, and Spain. When Louis XI. made his imprudent visit to Charles the Bold at Peronne, De Comines had much to do with calming down the duke's anger. Scott has given a graphic account in *Quentin Durward* of the transactions of the king and the future historian. In 1472 De Comines forsook the court of Burgundy for that of France, and Louis XI. rewarded him with the fief of Talmont. Under Charles VIII. he was deprived of his possessions and imprisoned, but was liberated, and took part in Charles's Italian expedition, during which he had an interview with Machiavelli. He was in favour with Louis XII., who rewarded him with office and pension. He died in 1509. Of the seven books of his *Memoirs*, six are taken up by the affairs of Louis XI., and the seventh deals with Charles VIII. in Italy. There are also his *Lettres et Négotiations*.

Comma Butterfly (*Polygonia albus*), a species of Butterfly found in England, and recognisable by the white *c* marked on the under side of the hind wings. It belongs to the family Nymphalidæ (q.v.).

Commandant, a commanding officer, *e.g.* the military governor of a town, district, or corps in some cases ; a term often used in English in speaking of foreign garrisons.

Commander, in the British navy, one holding rank between that of a lieutenant and that of a post-captain. The rank of "master and commander" was established in the latter half of the 17th century, and its holders have ever since received the courtesy title of captain. Commanders serve either as captains of sloops, corvettes, and vessels not important enough to be commanded by a post-captain, or as chief executive officer under a post-captain in a large ship. Promotion to the rank is by selection, and the full pay is £1 a day.

Commander-in-Chief. In the United States the command of the army and navy is vested by the Constitution in the President. In England, however, the functions of the Crown being constitutionally exercised through ministers, the administration of the army was, up to 1904, delegated to the Secretary of State for War, under whom was the Commander-in-Chief, the head of the active branch of the service, charged with the supreme command of the army at home, the superintendence of enlistment, the arrangements

[illegible]

Commission, an authority entrusted to any one. In the army it was originally applied to the warrant authorising an officer to raise, equip, and command a body of troops. It is now the warrant by which all officers, in the army from sub-lieutenant upwards, in the navy from lieutenant upwards, exercise their authority. A Royal Commission and a Parliamentary Commission are respectively bodies appointed by the Crown and either House of Parliament to investigate and report upon some subject—the relations between capital and labour for instance. The term is also applied to certain courts, *e.g.* the Irish Land Commission or the Court of High Commission appointed

under Queen Elizabeth, and abolished in 1641, to investigate ecclesiastical offences. *Special Commissions* are courts appointed by a special Act of Parliament to investigate and report on charges against particular bodies or persons. The Parnell Commission is a familiar recent instance. The "Commission of the Peace" is a term for the county and borough magistracy (excluding stipendiaries). From the practice in business of entrusting agents with goods to sell, etc., the payment made to such agents for their services has obtained the name of commission.

Commissionaires, CORPS OF, a body founded in 1859 by Sir Edward Walter for the purpose of giving employment to retired soldiers and sailors. They are employed in capacities where high qualifications are required, and may be engaged for permanent or temporary service. The commissionaires now number between three and four thousand.

Committee, a body charged with some special work, usually a subdivision of some larger body, e.g. the Finance Committee of the London County Council. Frequently, however, the whole of one chamber of a legislative body "resolves itself into a committee" for special work, usually for an examination of details analogous to that performed by special committees; as when the House of Commons "goes into committee of supply" or examines the clauses of a bill in detail at its "committee stage."

Commodore. In the British navy a senior post-captain provisionally invested with the ordinary powers of a rear-admiral, but entitled to fly a broad pennant instead of a flag. Commodores are of three classes, and each wears a rear-admiral's uniform, with but very slight variations. The full pay of a commodore of the first-class is £3 a day, with allowances. In yacht clubs, and in the merchant service, commodore signifies chief captain, either by election or by seniority, as the case may be. In the United States navy commodore is not a provisional distinction, but a regular rank, intervening between rear-admiral and captain, and having attached to it a salary equal to £1,000 a year.

Commodus, LUCIUS AURELIUS, Roman emperor, was born in 161 A.D. at Lanuvium. He succeeded his father, Marcus Aurelius, in 180, and though brought up with great care he immediately gave way to every form of vice. Physically strong, he used to fight in the circus like a gladiator to show his prowess, and abandoned himself to gluttony and debauchery. Yet he assumed the title of Hercules Romanus, and sought to be worshipped as if he were a god. Many designs were plotted on his life; at length his mistress, Marcia, gave him poison and then had him strangled by a celebrated athlete in 192.

Common, RIGHT OF, is the right of taking a profit in the land of another in common with others. It may either be such a right as is enjoyed in common with others to the exclusion of the owner of the land, or it may not exclude the owner of the

land. The commoner has no interest in the soil of the land on which he has a right of common. The profits, which may be the subjects of common right, are the natural produce of land (or water, which is included in the legal significations of land), such as grass and herbage, turf, wood, and fish. The commons relating to these subjects are accordingly called common of pasture, turbary, estovers, and piscary. Other things which cannot be called products of land, but rather part of the land itself, as stones and minerals, may also be the subjects of common right. Rights of way and other accommodations in the land of another, though they may be enjoyed in common by several persons, do not bear that name, but are called easements. Common appendant is a right of common which a man enjoys in respect of his title to a piece of land. The right is appendant or attached to the land. Common claimed by prescription (which supposes a grant) may be as various as grants may be. A right of common thus founded may be either annexed to land (when it is said to be appurtenant), or altogether independent of any property in land (when it is said to be in gross). Common in gross must be claimed, either by prescription or by deed, and is not appendant or appurtenant to any certain land. Common appurtenant may be severed from the land to which it was originally annexed, and then it becomes common in gross. The title to common by custom is peculiar to copyholders, and may also give the commoner various modifications of right. The rights of the owner of the soil over which a right of common exists are all such rights as flow from ownership, and are not inconsistent with the commoner's rights. Rights of common are conveyed like all other incorporeal hereditaments by deed of grant. When they are annexed to land they will pass with the land by any conveyance which is adapted to transfer the land. If the owner of common appurtenant purchase any part of the land over which the right extends, the right of common is altogether extinguished; it is the same if he releases his right over any part of the land. This unreasonable rule, however, does not extend to common appendant, though that will be extinguished if the commoner becomes the owner of all the land in which he has common, and partial extinguishment of the common will follow from acquisition of part of the land. The enfranchisement of a copyhold to which a right of common is annexed extinguishes the right. The Prescription Act (2 & 3 Will. 4, c. 71) applies to all varieties of rights of common, for the acquisition of which it enacts that after thirty years' enjoyment a right of common cannot be defeated by merely showing it commenced within time of memory, and, after sixty years' enjoyment, the right shall be absolute and indefeasible, unless it appear that the same was taken and enjoyed under some deed or writing. The remedies for disturbance of a right of common are the same as for the denial or obstruction of an easement.

Inclosure of Commons. The inclosure of commons is regulated by the Inclosure Acts, and these Acts contain many provisions for the protection of commoners and the formation of recreation

grounds, and "field gardens," and the "Commons Act, 1876," not only amplifies such provisions, but lays down various new regulations to prevent "inclosure in severalty" as opposed to "regulation of commons" being made, unless it be proved to the satisfaction of the Inclosure Commissioners and of Parliament that the inclosure will be of benefit to the neighbourhood as well as to private interests, and to those who are legally interested in commons.

Common Law. The law of England or the rule of civil conduct prescribed to its inhabitants consists of two principal divisions, viz. the *lex non scripta*, the unwritten or common law, and the *lex scripta*, the written or statute law. It must not be understood, however, that the unwritten or common law is at present merely "oral," or communicated to us from former ages to the present solely by word of mouth. It is true, indeed, that in the profound ignorance of letters which formerly overspread the whole western world, all laws were entirely traditional, for this plain reason, that the nations among which they prevailed had but little idea of writing. Thus, the British as well as the Gallic Druids committed all their laws as well as learning to memory, and it is said of the primitive Saxons here as well as their brethren on the Continent that *leges solâ memoriâ et usu retinebant*. But with us at present the monuments and evidences of our legal customs are contained in the records of the several courts, in books of reports and judicial decisions, and in the treatises of learned sages of the profession, preserved and handed down to us from times of great antiquity. And these parts of our law are termed *leges non scriptæ*, because their original institution and authority were not set down in writing as the *leges scriptæ* are; but they receive their binding force and authority of law by long and constant usage, and by their universal reception and acquiescence. Our unwritten or common law is divided into: (1) *General Customs*, which are the universal rule of the whole kingdom, and (2) *Particular Customs*, which affect only the inhabitants of particular districts.

[illegible]

2. *Particular or Special Customs* affecting only the inhabitants of particular districts; a custom of this kind it is usual to designate by the word "custom" simply, which sufficiently distinguishes it from the general customs above-mentioned.

These particular customs are mostly the remains of local customs prevailing in different parts of the country while it was broken into distinct kingdoms, and before the common law was collected and made applicable to the realm at large. Such, for instance, is the custom of Gavelkind in Kent, and some other parts of the kingdom; also Borough English, and many others, particularly the customs within the City of London as regards trade, apprentices, widows, orphans, and a variety of other matters. All these are more or less contrary to the general law, and are good only by special usage, though in many cases the customs have been confirmed or preserved by Act of Parliament. [BOROUGH ENGLISH, GAVELKIND.]

Commune, in France, the smallest administrative unit, corresponding very roughly to our civil parish, governed by a *maire* and popularly elected council. After the war of 1870-71 a number of Parisian radicals endeavoured to make Paris a single commune—*i.e.* to obtain popular municipal government. Most of them, however, wished France to be a mere federation of communes, and many held more or less socialistic views. The movement was finally suppressed by the Provisional Government (then located at Versailles) on May 28, 1871, after ten weeks' bloody civil warfare. [FRANCE.] This movement should not be confused with communism proper.

Communism. [SOCIALISM.]

Commutator, in *Electrical Engineering*, an important adjunct in direct-current dynamos, to cause all the electric currents which are generated in the revolving armature to travel in one direction in the external circuit. Without the use of the commutator alternating currents are produced, *i.e.* an oscillatory condition of the electricity is set up in the circuit without any ultimate passage of the electricity across any section of the conductor. [DYNAMO, ELECTRICITY.]

Comnenus, a family which furnished six emperors to the Byzantine throne, from 1057 to 1185, viz. Isaac I., Alexis I., John II., Manuel I., Alexis II., and Andronicus I. After the Crusaders had overthrown the power of the Comneni in Byzantium, they established themselves on the throne of Trebizond, and held the reins of government there until 1204. [ANNA COMNENA.] The last ruler of the house was David Comnenus, who, with his family, was executed in 1461 at Adrianople by command of Mohammed II.

Como, a city of Italy in Lombardy and capital of a province of the same name, is situated in a delightful valley at the southern extremity of Lake Como. It is surrounded by old walls, and was a place of importance in the time of Julius Cæsar, when it was named *Norum Comum*. The cathedral and the town-hall, both built of marble, date from

the 14th and 18th centuries respectively. Its manufactures embrace woollens, silks, cottons, and soap; and by its port an extensive trade with Swiss produce is carried on. During the 12th and 13th centuries it was a republic. It was the birthplace of the Plinys, elder and younger, and the physicist Volta. The province covers an area of 1,049 square miles, and produces silk and wine.

Como, LAKE OF, Lago di Como of the Italians and *Lacus Larius* of the ancients, a lake of Italy, is situated at the foot of the Pennine Alps. Into it flows the river Adda at the north, issuing at the south-east. Its length is 30 miles, greatest breadth $2\frac{1}{2}$ miles, and depth 1,929 feet. It is divided into two branches by the promontory of Bellagio, the smaller branch being named Lago di Lecco. It is celebrated for the beauty of the surrounding scenery, and many villas line its shores.

Comoro Isles, four volcanic islands in the Mozambique Channel between Madagascar and the continent of Africa. They are named Great Comoro, Johanna, Mohilla, and Mayotta, and cover an area of 1,050 square miles. They belong to France. The inhabitants are Mohammedans, and export cocoanut oil and tortoiseshell. At Dsandsi, the capital, is a French garrison.

Company (Lat. *cum* and *panis*), literally an assemblage of comrades or rather messmates. 1. In commerce a company generally denotes a combination of individuals who club their resources for trading purposes, but who do not take a personal share in the management, this being entrusted to a board of directors chosen from among them. In a partnership all the members have a share in the management unless they prefer to be sleeping partners. In former times every member of a company was liable to the extent of his fortune for the debts of the company; but this principle was found to act as a discouragement to the investment of capital, and in 1862 a Limited Liability Act was passed whereby each member of a company registered under the Act was liable for no more than the amount of his own shares. This Act, with subsequent modifications, is the basis of the majority of companies now formed, and many old companies and banks have placed themselves wholly or in part under its regulation and protection. The last few years have seen a great development of the Limited Liability principle. Some companies are quasi-public, that is, their shares are to be bought and sold in open market.

2. In a military sense, a division of an infantry battalion, corresponding with the troop in cavalry and the battery in artillery, and commanded by a captain. It is the administrative unit of the battalion which consists of eight fighting companies, of 120 men strong, and two depôt companies, and commanded by a captain, aided by a lieutenant and second-lieutenants, with a certain proportion of non-commissioned officers. The company is divided for drill purposes into two half-companies, each consisting of two sections, and has its own accounts and books, for the due keeping of which the captain is responsible to

the battalion commanding officer. An English battalion seldom has its full complement. In most other European armies the company, while still remaining the administrative unit of the battalion, is much more numerous, consisting (in the German army, for instance) of 249 men, and the captain is mounted instead of, as with us, on foot.

Comparetti, DOMENICO, was born in 1835 at Rome. In 1859 professor of Greek at Pisa, he exchanged that appointment for a similar one in the Instituto di Studi Superiori at Florence. While here he began to publish various papers of a philological character in the learned journals. He is best known through his *Virgilio nel Medio Evo*; also *Researches Concerning the Book of Sindibad*, published by the Folklore Society in 1882.

Compass. The mariner's compass, an instrument used to point out the course of a ship at sea, consists of three parts, the box, the fly or card, and the needle. The box, which contains the fly and needle, is a circular open brass case, so hung or floated, or otherwise supported, that it retains approximately the same horizontal position in all motions of the ship. The fly is a circular disc, generally of paper, representing the horizon, and divided into thirty-two equal parts by lines radiating from the centre and called rhumbs or "points." The intervals are subdivided into halves and quarters, and the entire circumference is also divided into 360 parts or "degrees." The angle between "point" and "point" equals, therefore, $11\frac{1}{4}$ degrees. The four chief or cardinal points are north, east, south, and west, and the thirty-two in their order, beginning from north and moving round to the right, are thus known:—

N	E	S	W
N by E	E by S	S by W	W by N
N N E	E S E	S S W	W N W
N E by N	S E by E	S W by S	N W by W
N E	S E	S W	N W
N E by E	S E by S	S W by W	N W by N
E N E	S S E	W S W	N N W
E by N	S by E	W by S	N by W

The origin of the mariner's compass is lost in the mists of antiquity, and nothing certain is known of it. F. Gioja, at the beginning of the 14th century, seems to have been the first to devise some such a form of it as has been described above. The magnetic needle's variation or declination (q.v.) from the true north was discovered by Sebastian Cabot in 1497, and its inclination or dipping when it is so hung as to play vertically to a point beneath the horizon, was first remarked by Robert Norman in 1576. The different variations or declinations at various times in the same locality were originally noticed by Gillibrand in 1634, though the observation has been claimed for Gassendi. To "box" the compass is to repeat the points of the compass in their proper order.

Many modifications of the compass have been introduced, and the one now in almost universal use is the invention of Sir William Thomson. A number of strips of steel are magnetised

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Composition, in *Dynamics* or more generally in vector calculus, means the addition of two or more quantities that possess direction and sense as well as magnitude; such as a number of velocities, forces, or rotations. The sum obtained by the process is called the *resultant*; the constituents

of this resultant are called its *components*. [POLYGON OF FORCES, VECTOR ADDITION.]

Composition with Creditors, an alternative course of proceeding by any one in insolvent circumstances to that of bankruptcy, which has always been of extensive use, being in many respects more convenient, and not entailing the publicity of bankruptcy. The general principles of the law of bankruptcy, however, apply to a composition, though in some of its details it differs from the course devised for a bankruptcy, and it is expressly provided by the existing "Bankruptcy Act, 1883," that the trustee (if any), under a *composition or scheme of arrangement* under that Act, shall have the same powers and perform the same duties as a trustee under a bankruptcy, and that the property of the debtor shall be distributed in the same manner as in bankruptcy, and generally that all the provisions of that Act with reference to bankruptcy shall also apply (*mutatis mutandis*) to such a composition or deed of arrangement. The true spirit of the bankruptcy laws has always been to provide the easiest way of carrying out amicable arrangements between a man and his creditors freed from external interference, so far as the prevention of fraud and commercial morality would permit. Two methods of proceeding have consequently been authorised by the Legislature for this purpose; these are by composition or scheme of arrangement either before or after adjudication.

Compound, CHEMICAL. [ATOMIC THEORY.]

Compound Interest. [INTEREST.]

Compound Magnets. When a solid piece of steel is magnetised we find that the external surface is much more intensely affected by the magnetising influence than the interior, and it is difficult to render the whole mass uniformly magnetised. If, therefore, a powerful magnet is to be manufactured, it is usual to build it up of thin strips or rods of separately-magnetised steel, the whole bundle being then bound together or the pieces fixed parallel to each other on a suitable framework. Such an arrangement is called a compound magnet; it is stronger than the simple magnet, and retains its magnetism more permanently.

Compound Pendulum. A simple pendulum is understood theoretically to mean an infinitely small mass suspended from a point by a thread without mass. Such an arrangement cannot exist, and can only be approximated. Any distribution of mass oscillating about a point from which it is suspended forms a compound pendulum. Its period of oscillation is equal to that of a simple pendulum of determinate length; this is called the *equivalent* simple pendulum. In every compound pendulum there exist pairs of points, either of which may be made the centres of suspension without changing the rate of swinging. [PENDULUM.]

Compound Proportion. [PROPORTION.]

Compounding Felony or Theft. Where any one has been robbed and he knows the felon, and receives back from him his goods that were stolen, or some other amends, upon agreement not

to prosecute, this is a misdemeanor. Under a statute of Victoria's reign, known as the "Larceny Act" (24 and 25 Victoria, c. 96), who-soever shall publicly advertise a reward for the return of any property whatsoever which shall have been lost or stolen, suggesting that no questions will be asked, or offering to repay to any pawnbroker or other person the amount advanced on the security of the property, forfeits the sum of £50 for every such offence, to be recovered by any informant thereof. And the printer and publisher are also liable, but in their case the action is to be commenced within six months, and only after obtaining the sanction of the Attorney- or Solicitor-General to the institution of the prosecution.

Compressed Air Engine. A type of motor much used for certain special kinds of work, in which the motive power is supplied by high-pressure air. The engine is pretty much the same in principle as the steam-engine, compressed air supplying the place of high-pressure steam. This air is compressed by suitable pumping machinery, which may be at some distance from the air-engine. Such an arrangement is convenient in boring, tunnelling, or similar work, where it is difficult to introduce steam or other motors, and where the pressure energy required may readily be conducted to the scene of operations by air-pipes from the distant pumps. [PNEUMATICS.]

Compressibility. That property of matter by which it may be diminished in volume when subjected to pressure. All substances, solid, liquid, and gaseous, are to some extent compressible. Gases submit to diminution in volume readily, the intensity of pressure required to effect this being inversely proportional to the volume. Thus, if the gas be compressed to half its bulk, the new pressure which it exerts, and which must therefore be exerted on it, will be double the former pressure. This is known as Boyle's Law (q.v.). Liquids and solids, on the other hand, offer very great resistance to change of volume, though the former are changed in shape under the action of slight distorting forces. The famous Florentine experiment, in which a hollow sphere of gold, filled with water, allowed so little compression that the water oozed through the gold shell when subjected to great pressure, was regarded for some time as a proof of the non-compressibility of water. Nevertheless an instrument called the *piezometer* demonstrates and measures the diminution in volume of water or other liquids under pressure. Water diminishes $\frac{1}{20000}$ th of its volume under a pressure of one ton per square inch. It must be understood, however, that, under special circumstances, the liquid condition of matter may merge imperceptibly into the gaseous. Towards this critical condition of temperature and pressure it is found that the liquid suffers much change in volume for slight changes in pressure. The compressibility of solids, as a rule, is less even than that of liquids. The compression of ice at 0° C. will convert it to water [REGELATION], and the compression of steam at boiling-point will convert it to water, for pressure

quality ; a purchaser is bound by the sale, although there may exist extrinsic defects in it known only to the vendor which greatly affect its worth. [CAVEAT EMPTOR.]

Concentration Camps. In the Boer War (1899-1902), a system was adopted, by means of which the women and children of those Boers who were fighting were concentrated into camps by the British. Much discussion as to the state of those camps was aroused by the publication of a Report by Miss Hobhouse. A commission of ladies to investigate was appointed by the Government in 1901.

Concepcion. 1. A seaport of Chili, and capital of a province of the same name, is situated near the mouth of the Biobio river. It is a well-built town with a cathedral, and its port Talcahuano, $7\frac{1}{2}$ miles away on Concepcion Bay, is one of the safest and most commodious in Chili. The province of Concepcion covers an area of 3,535 square miles, and has fertile plains and rich coal mines. 2. The name given to two towns in Bolivia, one in the department of Tarija, in a wine-producing district, the other in the department of Santa Cruz, where there are mines; also to a town in Mexico, and another in San Domingo. 3. A town of Paraguay, and capital of the district of the same name, is situated on the Paraguay river.

Concepcion del Uruguay, formerly the capital of the province of Entre Rios in the Argentine, is situated on the river Uruguay. Its chief industry is in slaughtering.

Concertina, a musical instrument resembling the accordion, invented in 1829 by Sir Charles Wheatstone.

Conchoid, a curve invented by Nicomedes, by which any angle may be trisected.

Conchology (Gk. *conchè*, shell), the science of shells, sometimes used as synonymous with the scientific study of molluscs, which were formerly classified according to the formation of their shells.

Concierge (from Lat. *conservare*, preserve or guard) is a French word signifying the porter and guardian of a house let off in different apartments or flats.

Concord. 1. A town of the United States, in Middlesex county, Massachusetts, is situated on the Concord river, about twenty miles north-west of Boston. It has a large flannel manufactory, and was the residence of Emerson, Thoreau, and Hawthorne. It was the scene of a skirmish between the British and a small body of militia on April 19, 1775, when the first blood of the revolution was drawn. 2. The capital of the state of New Hampshire, is situated on the Merrimac river, along whose front it extends for two miles. It has extensive granite quarries and various manufactures in textiles and machinery.

Concordance, a kind of index—generally verbal—to a book or a writer. The word came into especial use with reference to the Biblical

Concealment is the act of
 party to a contract, as to
 reliance on the other party
 In such a case, the
 supplier is not bound
 one party is not bound
 leonard is not bound
 possible to be bound
 occur in a contract
 formed by a contract
 whereby a contract
 other than a contract
 the contract is not
 the contract is not
 unbound by a contract
 subject to a contract

Concordance, published in 1737 by Cruden. This was not an original idea, since there already existed a Concordance to the Vulgate. In 1845 Mrs. Cowden Clarke published a Shakspeare Concordance, and since then the principle has been applied to the works of many poets, and to the body of English poetry—or, at least, to the works of the best-known poets.

Concordat (Lat. *concordatum*, a thing agreed upon) may mean any kind of convention or *modus vivendi*, but is more commonly used to signify the compact, made in countries where Catholicism is the prevailing religion, between the Pope and the civil authorities, and having for its object the securing of their respective rights. Theologians have differed as to the exact nature and the binding force of the concordat. The most notable concordat is perhaps that concluded in 1801 between Pius VII. and Napoleon, then First Consul.

Concordia, a town of the Argentine republic, in the province of Entre Rios, is situated on the Uruguay river. It is connected by a railway 97 miles long with Monte Caseros.

Concrete, a composition consisting of some cement as mortar, hydraulic mortar, asphalt, etc., mixed pebble, broken bricks, etc. It sets forming a hard, durable mass, and is largely used for formation of pavements, the foundations of houses, for structures below water, and sometimes even for walls of houses. In the latter case it is filled in between boards, and when set the boards are removed.

Concretion. For urinary and biliary concretions see CALCULUS. Intestinal concretions are not uncommon in some of the lower animals.

Concretions, more or less isolated masses, spherical, elliptical, or irregularly nodular in form, occurring commonly in layers in stratified rocks, varying in size from minute particles up to masses several feet in diameter, and generally differing in composition from the rock in which they are imbedded. Thus, in alluvial clays and gravels we find fantastically irregular nodules of calcareous matter known as "race," "fairy-stones," or, on the Rhine, "löss-puppen"; in the Lias, Oxford, London and other clays we have the large "septaria" (q.v.) of impure limestone; in clays or in Chalk we have nodules of iron pyrites; and in the latter the well-known flints, resembling the siliceous phthanites and cherts occurring in other limestones. Concretions have been formed subsequently to the deposition of the rock in which they are, the lines of stratification often passing through them. They are often formed round a fossil as a nucleus, or have caught up one or more in the process of their formation, these fossils not being necessarily at all similar in composition to the nodule. That they have been produced by chemical aggregation is evidenced by the presence of less silica diffused as an impurity through chalk in the vicinity of lines of flint nodules than farther from them. The general law of their formation would seem to be that any chemical substance, existing in a small proportion diffused

through the mass of a rock, is likely to be drawn together in lumps, especially round any solid body. Some rocks exhibit a concretionary structure throughout, as in the beds of clay-ironstone nodules in the Coal-measures, in oolite (q.v.), and in pisolite; and in other cases a flaking off of concentric shells is only manifested on the decay of the rock when exposed.

Concubine (Lat. *concubina*) signifies literally a bed-fellow, and specifically, a woman whose connection with a man, though of a somewhat permanent nature, is less binding than the tie of marriage. The Roman law admitted other kinds and degrees of marriage than the full and formal *confarreatio*; and though the Christian Church set its face against irregular sexual connections, it was long before the practice of concubinage was generally put down. Students of Church history will remember the tenacity with which in some countries the priesthood clung to the practice, which lingered also among the laity in England as the custom of hand-fasting. Concubinage has fallen into disrepute in England, but is looked upon leniently in many Continental countries.

Concussion of the Brain. The symptoms of brain injury have been referred by surgeons into two groups. The term concussion of the brain is applied, roughly speaking, to those cases in which a head injury produces insensibility unaccompanied by any actual paralysis; while if, on the other hand, paralysis is developed, the condition is said to be one of compression of the brain. In thus drawing a hard and fast line between two classes of symptoms, the origin of the terms concussion and compression is practically ignored. When the word concussion was first employed by surgeons it was intended to be applied to those cases where, as the result of injury, the brain was shaken, but not affected by any gross lesion. While to other cases, where the injury produced rupture of blood-vessels within the cranium, with effusion of blood, and resulting pressure upon the brain, the term compression was applied. Inasmuch, however, as the sudden increase of pressure within the skull, produced by the rupture of a blood-vessel, is frequently productive of some form of paralysis, the existence of paralysis came to be associated with compression, and its absence with concussion. The symptoms of concussion are those of shock (q.v.). The patient is unconscious, with pale face, cold skin, feeble and often irregular pulse, and shallow and feeble attempts at respiration. This first stage or stage of collapse, as it is called, may terminate fatally, or may be rapidly followed by recovery, but it usually passes into what is termed the stage of reaction. In this last event consciousness returns, and some febrile movement is set up, which is either after lasting a few days followed by convalescence, or, in unfavourable cases, passes into an inflammatory stage. Treatment of the initial symptoms of concussion consists in placing the patient in bed, keeping him warm, and as quiet as possible. Stimulants should be avoided. Medical advice must, of course, be at once obtained, as a head injury severe enough to

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Condenser. In *Chemistry*, a piece of apparatus employed for the purpose of condensing to the liquid state the volatile vapours evolved in distillation (q.v.). The most common and generally useful form is that known as Liebig's condenser, consisting of an inner glass tube surrounded by a larger outer tube, with a current of cold water kept flowing between the two. If very volatile liquids are being distilled it is frequently necessary to pass the gases through a spiral tube or "worm" surrounded by ice-cooled water or a mixture of ice and salt. Various complicated forms of condensers are sometimes employed, which serve also to partially separate the more volatile from the less volatile products of distillation. In the *steam engine* it is an arrangement for converting the exhaust steam into water, so as to diminish the back pressure in the cylinder to a much lower intensity than that of the atmosphere. Engines that do not employ such an arrangement are termed *non-condensing* engines, of which locomotives afford an illustration. Economy of space and weight may forbid their use, though with them the engines are more efficient. Condensers are of two types:—*Jet* condensers employ a jet or spray of water falling into a suitable chamber. The exhaust steam enters from the cylinder, and is at once condensed. It warms the water, but cannot return at any high temperature to the boiler again. *Surface* condensers consist of a series of communicating metal tubes into which the steam passes; the tubes are kept cold by water flowing round them on the outside. The condensed steam in this way does not mix with the condensing water, and may be pumped back into the boiler at a high temperature. This arrangement utilises a certain amount of heat, the same water is used continually, and very little sediment is deposited in the boiler. [STEAM-ENGINE.] In *Electrical Engineering* it is an arrangement of two conductors separated by a non-conductor or *dielectric*. Thus a Leyden jar, consisting of a glass vessel coated inside and outside with tinfoil, or a submarine cable formed of a conducting wire insulated from the surrounding water by a guttapercha coating, affords an example of condenser. So also a thunder-cloud and the earth, with the non-conducting air between them, form a condenser. If a quantity of positive electricity be introduced on to one of the conductors, an equal quantity of negative electricity will be induced on the nearer side of the other conductor. If the two conductors are close together, the tendency for these opposite electricities to combine is almost permitted, and there is not much potential energy in the system; if the conductors are far apart and if they possess the same quantities of electricity as before, work has been done to separate them and the system is at a higher potential. So, in the former case, it will require a larger amount of electricity on the conductors to bring the potential energy up to the standard *volt* (q.v.). This amount of electricity is called the *capacity* of the condenser; it is measured

theoretically in *farads*, commercially in millionths of a farad, or *microfarads*. If the dielectric is not sufficiently thick or strong, the tendency of the two electricities to combine will be great enough to break the dielectric—as for example in the lightning-flash which exhibits the disruption of the air-space between the cloud and the earth. Practically, the capacities of condensers are increased by making them of several pairs of plates instead of a single pair. The dielectric is chosen of paraffined paper or mica, to effect the same result. Their use in practice is very extended. [ELECTRICITY, CAPACITY.]

Condillac, ETIENNE BONNOT DE MABLY DE, philosopher, was born in 1715 at Grenoble. He was instructor to the Duke of Parma, Louis XIV.'s grandson, and for him many of his treatises were written. In his *Essai sur l'Origine des Connaissances Humaines* he contends against the doctrine of innate ideas, and in the *Traité des Systèmes* he supports the theory that knowledge is based on experience. Other of his works are *Traité des Sensations*, *Traité des Animaux*, and *Le Commerce et le Gouvernement*, which appeared in 1776, the same year as Adam Smith's *Wealth of Nations*. Condillac, too, was a free trader, and he treats political economy as the science of exchanges. In 1768 he was elected to the Academy, and in 1780 he died on his estate at Flux, near Beaugency.

Condiments (Lat. *condire*, to pickle) are those articles of food, or rather those accompaniments of food, which are used to impart a relish or as incentives to appetite, rather than for any nutritive value that they may possess. Among these, the best known are salt, pepper, mustard, vinegar, and piquant sauces.

Condition is a restraint annexed to anything, so that by its non-performance the party to it shall receive prejudice and loss, and by its performance commodity or advantage, or it is that which is referred to as of uncertain chance, which may or may not happen. There are several kinds of conditions, as

1. *A Condition in a Deed*, which is *express*, as if a person make a lease of property to another, at a certain rent and under certain covenants, upon condition that if the lessee fail in payment at the day or in preference of his other covenants, then the lessor may re-enter.

2. *A Condition in Law* is implied as when one grants to another an office as keeper of a park, steward, bailiff, etc., for a term of life. Here, though no condition be expressed in the grant, yet the law implies that the grantee shall faithfully execute all things belonging to the office, otherwise the grantor may discharge him.

3. *A Condition Precedent* is where an estate is granted to one for life on condition that if the grantee pay to the grantor a certain sum of money on a particular day, he shall have the fee simple. In this case the condition precedes the estate in fee which does not vest in the grantee till performance thereof.

4. *A Condition Subsequent* is where one grants to

another an estate in fee upon condition that the grantee shall pay him on such a day a certain sum, or that his estate shall cease. Here the condition is subsequent and follows the estate, and upon the performance thereof continues and preserves the same, so that a condition precedent gains the thing made upon condition by the performance of it, whereas a condition subsequent keeps and continues it by the performance of the condition.

Conditions are likewise *affirmative*, which consists of doing an act; *negative*, which consists of not doing an act; *restrictive*, for not doing a thing; *compulsory*, as that the lessee shall pay rent, etc.; *single*, to do one thing only; *copulative*, to do divers things; and *disjunctive*, where one thing of several is required to be done.

Conditional Immortality, an idea which is the creation of certain religious sects, which hold that man's life generally is like that of other animals, but that those who have faith in Christ are privileged to live on still in a future existence. It is a theory resting on no scientific basis, but founded in part upon certain interpretations of passages of Scripture, and naturally incapable of either proof or disproof.

Conditions of Sale. When a freehold, copyhold, or leasehold property is offered for sale by auction, "Conditions of Sale" (indicating the nature and extent of the vendor's title, the terms of the sale as to completion, etc.) are prepared by the vendor's solicitor, and usually taken "as read" at the auction. It behoves an intending purchaser *carefully to look at these* before attending the auction, and to be advised thereon by his solicitor, *particularly* in regard to the condition as to title. This is not very frequently done, although entailing a very small expense. Hence, an unsatisfactory title is often foisted upon him. The conditions are generally subject to modification in the auction room.

Condonation. [DIVORCE.]

Condor (*Sarcorhamphus gryphus*), the great vulture of the Andes, the largest species of the family. Before Humboldt's time the most extraordinary stories were told of the size and strength of this bird, and to that traveller is due the credit of recording measurements which brought down the estimated wing-spread of 15 feet to 8 ft. 6 in. or 9 feet, and gave the average length of an adult male as 42 inches; the female is somewhat less. The home of the Condor is in the Andes, and it ranges down the west coast as far as the Straits of Magellan, on the east to the mouth of the Rio Negro. The general hue of the plumage is black, the secondary feathers and most of the wing coverts are grey. There is a white downy ruff on the neck; above this the head and neck are bare; and the male has a large fleshy comb. These birds feed on carrion, which they discover by sight rather than by smell, and their flight is remarkably powerful. According to Darwin they make no nest, but lay two large white eggs on a shelf of bare rock. The king vulture (*S. papa*), the only other species of the genus, is a smaller and rarer

bird. The general plumage is fawn, and the head and neck are covered with orange, purple, and crimson caruncles. It is a native of the wooded parts of Central and South America, and derives its popular name from its tyrannising over the Turkey vultures (q.v.). [VULTURE.]

Condorcet, JEAN ANTOINE NICOLAS DE CARI-
TAT, MARQUIS DE, was born in 1743 at Ribemont,
in the French department of Aisne. Educated at
the Jesuit College, Rheims, he thereafter studied
mathematics with great success in Paris, at the
College of Navarre. In 1765, through an essay on
the "Integral Calculus," he was elected to the
Academy. During the Revolution he used his pen
on the side of the people, being appointed in 1791,
by Paris, to the Legislative Assembly, of which, in
1792, he became president. He opposed the execu-
tion of the king, though willing that he should be
punished, and in consequence fell under the
suspicions of the extreme party, by whom he was
condemned. Driven from place to place of con-
cealment, he was at length arrested, and, on the
7th of April, 1794, thrown into prison of Bourg-la-
Reine, where he was found dead on the following
morning. By what means he met his death is not
known. In his own day he was chiefly noted for
his application of mathematical calculations to
human conduct, and as to his philosophic views in
general they were of the broadest and most
advanced kind.

Condottieri, a word of Italian origin applied in the Middle Ages to the leaders of bands of Free Lances or Free Companions, which was the name given to those mercenaries who, trained to arms, and having no special country, traversed Europe always ready to take service for hire on swords to the highest bidders. The name was also applied to the modern standing armies, and to the modern cultivation of patriotism. But the best picture of the *Condottieri* is given a good picture of the *Condottieri* in the *Legend of Montrose*, described in the same manner as the same character in the *Legend of Montrose*, and in the *Legend of Montrose*.

Conduction is the transfer of heat or electricity through a medium at lower temperature. No intervening material is required to alter their relative positions. Different materials have different conductivities. Metal is a good conductor both in heat and electricity. The first of the substances mentioned in the preceding paragraph is a poor conductor of heat, but a good conductor of electricity. In a vacuum, neither heat nor electricity can be transferred. **HEAT**

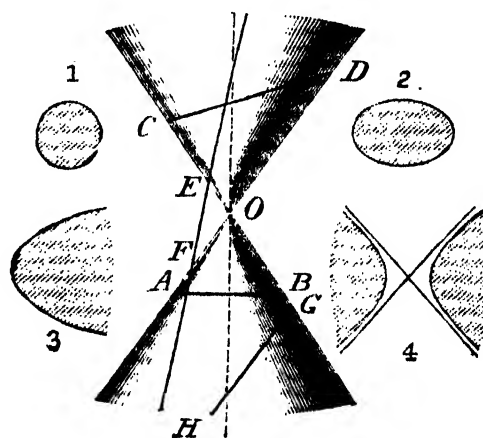
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when to stop. On some English railways a kind of superior guard upon certain important trains is sometimes called a conductor; and of late years Messrs. Cook have made us acquainted with personally-conducted travelling parties.

Condyl's Fluid, the name of a solution largely employed as a disinfectant and deodoriser.

Cone, the female flower of the majority of the Coniferæ (q.v.), consisting of a more or less elongated axis which often becomes woody, and bears, either in alternating whorls or more commonly in complex spirals, the sporophylls, cone-scales, bract scales, or open carpels, as they are variously termed. In the juniper there are but three scales in a whorl which become fleshy and form the well-known berry. In other Cupressineæ there are alternating whorls of two, three, or four carpels bearing ovules, often many in number on a placental swelling in their axils. In many other conifers this placenta is replaced by a scale, or ligular appendage of the carpel, known as the seminiferous scale, bearing two ovules on its inner face. This seminiferous scale, as to the exact nature of which there has been much dispute, generally outstrips the carpellary scale in growth, and becomes woody. In pines (q.v.) it acquires a thickened woody extremity or *apophysis*, forming one of the diamond-shaped *tessellæ* on the surface of the unripe cone. In the firs (*Abies*) carpellary and seminiferous scales alike fall away from the axis when the seed is ripe; in the spruces (*Picea*) the cones fall whole; and in pines they persist on the tree, only opening to drop their seeds.

Cone is a surface, the general form of which is generated by a line moving so that it always passes through a given point and always cuts a given closed curve. If the closed curve be a circle and the given point be vertically above its centre, we



CONIC SECTIONS.

obtain the *right circular cone*. This may be regarded as the solid generated by a right-angled triangle revolving about one side. This side forms the *axis* of the cone, the slant edge of the triangle generates the curved surface, and the third side generates the circular base. It is by cutting this special solid in plane sections that we obtain the *conic sections*. The volume of a cone is obtained

by multiplying the area of its base by one-third of its vertical height. Its mass-centre is one quarter of the way up its axis. If a section be made of the cone at right angles to its axis, as across A B, a circle is obtained. If across from one side to the other, as C D, an ellipse is produced. If parallel to the slant edge of the cone, as G H, the curve of section is of infinite extent; this is the parabola. If the cut is made so as to include sections on both halves of the cone, as E F, we get the hyperbola, which evidently possesses two branches. If the cut passes through the apex O, we get a line pair or a point. All these sections are known as *conics*, and are much studied in mathematics by both geometrical and analytical methods. Generally, they are defined as the curves which mark the positions of those points in a plane, whose distances from a given point are proportional to their distances from a given straight line in the plane. In projective geometry (q.v.) totally different definitions may be introduced as the basis of their investigation.

Coney Island, situate at the entrance of New York harbour, and near the S.W. angle of Long Island, is five miles long and half a mile broad. It is a popular summer resort, and is the terminus of several railways connecting it with Brooklyn. Steamers also ply in the bathing season between it and New York, which is eleven miles distant.

Confederate States is the special name applied to the eleven of the United States of America—namely, North and South Carolina, Alabama, Florida, Mississippi, Georgia, Louisiana, Texas, Virginia, Arkansas, and Tennessee—which seceded from the Union in 1861 upon the question of slavery and the election of President Lincoln. They entered again into the Union at various dates after the end of the Civil war, under revised constitutions.

Confederation of the Rhine was the union of sixteen German princes in 1806, who, in alliance with France and under the protection of Napoleon I., forsook the general body of German interests. This somewhat unpatriotic combination existed till 1813, when the reverses of Napoleon gave it its death-blow, and gave rise to a healthier desire for German unity.

Conferva, the typical genus of the *Confervoideæ* *Isogamæ*, named from floating on the surface of ponds with many imprisoned bubbles of gas. The filaments in these algæ are unbranched.

Confervoideæ, a somewhat ill-defined group of filamentous algæ, mostly living in fresh water, in which the branched or unbranched filaments have a mucilaginous sheath, and the chlorophyll is diffused throughout the cells. They are now divided into the *Isogamæ* and the *Heterogamæ*. In the former sexual reproduction occurs by the conjugation of similar ciliated zoospores; but the ordinary modes are asexual by the germination of zoospores or of detached resting-cells. *Conferva*, *Ulothrix*, *Chaetophora*, *Chroolepus*, belong here. The *Heterogamæ* include *Edogonium*, *Sphaeroplea*, *Coleochaete*, etc., in which the conjugating bodies are dissimilar, and the female gamete is usually stationary.

Confession, in an ecclesiastical sense, signifies the avowal of sin, sometimes, as in early times, to the congregation at large, and sometimes to the priest, who is looked on as the vehicle of forgiveness. No ecclesiastical question has more heated men's blood, and it still forms an ecclesiastical "red rag." Private confession seems first to have become habitual about the fifth century; the Lateran Council of 1215 made it optional; the Council of Trent made it obligatory, or nearly so. Auguste Comte (q.v.) has strongly commended it.

Confessional, a word sometimes used to denote—among its enemies—the practice of auricular confession, but more specially signifying in ecclesiastical architecture a small building, generally of wood, within a church for the convenience of penitents and their confessors. It generally consists of a central compartment, in which the priest sits, and which has upon one or both sides a grating, which communicates with a recess occupied by the penitent, who makes his communication through the grating. The confessional has given occasion to the display of some exquisite wood-carving.

Confession of Faith in a wide sense denotes a creed or other embodiment of the religious faith of a Church, but it is often used in the more modified sense of a declaration of belief set forth by one or other of the Reformed Churches or Communities. These confessions are numerous and varied. The most notable are that of Augsburg in 1530, which was the first attempt at unity and conformity of doctrine among Protestants, and that of Westminster in 1647, which embodied the principles that governed Presbyterian practices.

Confidential. [PRIVILEGED COMMUNICATION.]

Confirmation, the act of making a thing valid, a ratification. We speak of the confirmation of a treaty, of an appointment, of a rumour. In an ecclesiastical sense it signifies the laying-on of hands by a bishop upon a baptised person, being looked on in some churches as a Sacrament, by others as a pious practice. In the Eastern Church the rite is administered immediately after baptism, in the Western it is delayed for a certain number of years, the general test of fitness being the knowledge upon the part of the candidate of the responsibilities which he undertakes. In the English Church the age at which the rite is administered depends in a great measure upon the opinion of the officiating prelate, but the general tendency is to confirm at an earlier age than in the early part of the 19th century. Confirmation in the Church of England, though a usual, is not an indispensable preliminary to Communion.

Confucius, the Chinese philosopher, was born 551 B.C. in Chüeh, in the state of Lu, a component part of the existing province of Shantung. The name Confucius is Latinised from Kung Futsze, Kung being the family name of royal descent. While only three years of age Confucius was left with his mother in poor circumstances, his father

dying then. At the age of seventeen he became an inspector of the public corn stores, and at nineteen he married, his progeny being a son and two daughters. In 517 B.C. he began his career as a teacher, and in the same year visited the capital, where he fell in with Lao-tze, the founder of Taoism. After returning to Lu, and another short absence therefrom occasioned by some revolutionary disturbances, he at length, under Duke Ting, became in 501 B.C. governor of the town of Chung-too, where the effects of his sagacious administration soon became apparent. This led to higher appointments, and as minister of crime he became the practical ruler of Lu, with the result that it was the best governed state in China. This stirred up the envy of the rulers of neighbouring states, and means were sought to compass the downfall of Confucius. This was accomplished by playing upon Duke Ting, his chief, who in consequence gave himself up to dissolute courses, and became estranged from his great counsellor. Confucius accordingly left Lu in 497 B.C., and with a band of disciples sojourned in many different states. He rejected the offers of princes to settle in their kingdoms, strictly adhering to the condition that he should be free to carry out his own ideas of government. In 495 B.C. Duke Ting died, and his successor, in the tenth year of his reign, recalled Confucius, who, however, never again assumed the reins of government as before. He has left no work by his own hand expounding his moral and social systems. He revised, however, the ancient writings which comprise the canonical works of Confucianism, viz. the Yih-king, the Shu-king, the Shi-king, the Le-king, and the Chun-tsién; and is said to have written the Chun Chiu, an enumeration of the historical events of Lu from 722 B.C. to 481 B.C. His works are copious details in the *Chun Chiu*, and a compilation from the reminiscences of his disciples. His teaching has ever been the basis of the law in China, who still enjoin that to his teaching every prefecture, sub-prefecture, and market-town, a temple, a school, and a place for paying homage to Confucius. His death was the failure of his career. [For his teaching and representative of the Confucian system, thereby the title of "the great teacher" next to the mem-

fins well developed. *C. vulgaris*, the Conger, or Conger-eel, plentiful round the British coast, is the best known species, and is nearly universally distributed. The length may range from 3 ft. to 8 ft.; the general hue is pale brown above, dull white below, but the upper surface may be darker or lighter according as the fish lies among rocky or sandy surroundings. The flesh is coarse and little esteemed, but when dried and grated it makes excellent soup, and some of that sold as "real turtle" is said to be prepared therefrom.

Congestion. The undue accumulation of blood in any part of the body may be brought about by increased supply, through dilatation of the arterioles (*active congestion*), or by obstruction to the return of blood from the part (*passive congestion*). Active congestion may be regarded as the early stage of inflammation (q.v.). Passive congestion may arise directly from venous obstruction, or from interference with the general circulation, leading to impaired power of effecting the natural transmission of the blood through the various organs and capillary systems of the body, and to its accumulation.

Congleton, a market-town of England, in the county of Cheshire, is situated in the valley of the Dane, near the Macclesfield canal. Its manufactures are in cotton, ribbons, and silks; it has also salt-works and coal-mines in the neighbourhood. Pop. (1901), 10,706.

Congo (properly *Mwishi-Kongo*, plural *Eshi-Kongo*, Congo People), an historical West African Bantu nation, who occupy the region traversed by the Lower Zaire, which from them takes the name of the river Congo. At the arrival of the Portuguese (1484), the paramount *mani* (king, emperor) exercised a nominal authority over six vassal princes, who, after their conversion (1487), received the Portuguese titles of Dukes, Counts, and Marquises. The *mani* became a *sôva* (Port. *soberano*, sovereign), and his capital, Banza-Congo (Ambassi), took the name of San Salvador, which it still retains. This place became a great centre of civilising influences, and its splendours (churches, convents, palaces) are described in glowing language by contemporary writers. Even after its destruction by the hordes of Jagga savages about 1550, it rose from its ashes more magnificent than ever, and at the beginning of the 17th century was a flourishing city of 40,000 inhabitants. But in 1636 a civil war broke out between the *sôva* and a powerful vassal, resulting in the triumph of the latter and the expulsion of the Portuguese. Since then San Salvador has again become a mere *banza* (native village), whose hovels are grouped round the scarcely visible ruins of its former greatness. But numerous reminiscences of Portuguese culture still survive amongst the Congo people, who are certainly the most civilised of all Bantu nations. Their language (Kishi Kongo) has been cultivated for over 300 years, and is the most polished and richest of all Bantu idioms; current along the western seaboard from Loango to Angola, and for about 150 miles inland. See Rev. W. Holman Bentley's *Dictionary, etc., of the Kongo Language*; London, 1887.

Congress (from *con*, together, and *gredi*, to go, to enter), a meeting of many persons, especially of the members of a legislative body, for the purpose of discussing and determining upon some common object. The word is also used to denote a meeting of a church or society, or a meeting of a group of persons for the purpose of discussing and determining upon some common object. The word is also used to denote a meeting of a group of persons for the purpose of discussing and determining upon some common object.

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Congo, a river on the W. coast of Africa, in latitude 7° S., was discovered by Diego Cam about 1484. By the natives it was called Moenzi Nzadi or the "receiver of all the waters," and by the Portuguese Zaire. It was at one time supposed to be one of the mouths of the Niger, a theory that led to its exploration in 1816 by Captain Tuckey, who ascended it for about 170 miles. Dr. Livingstone in his investigations of the regions between Lakes Nyassa and Tanganyika came upon a river, the Chambezi; this he followed to Lake Bangweolo, and lower down traced it as the Lualaba as far as Nyangwe. From this point, in 1876, Stanley took up the course of the river discovered by Livingstone, and proved it to be identical with the Congo, the great equatorial river of Central Africa. The length of the Congo is estimated at about 3,000 miles, with a drainage area of upwards of 1,300,000 square miles. The volume of its waters exceeds the volume of the Mississippi, and with such momentum does it rush into the ocean that vessels sometimes enter its discoloured water 300 miles from its mouth. Of its many tributaries the most important are the Aruwimi, Kwa, and Welle-Mobangi. For 110 miles from its mouth it is navigable, when cataracts interrupt it. In its upper regions it again becomes navigable for steamers of a light draught. The importance of this great water highway was soon recognised, and in 1876 an international association, with the King of the Belgians as president, was formed with the aim of preserving the neutrality of the Congo area.

Congo Belge, originally the CONGO FREE STATE, has an area of 909,654 square miles, with a population estimated at about twenty millions. The Free State was the result of the efforts of the international association just alluded to, and was recognised by the European Powers in 1884 and 1885, when its boundaries were settled. It was placed under the sovereignty of Leopold II., King of the Belgians. Among the conditions of its recognition by the Powers were that the rivers within it should be free to all nations, that no duties be imposed on imports, and that the slave trade be suppressed. In 1908 the state was annexed to Belgium, and a Minister for the Colonies was appointed; he is President of the Colonial Council, consisting of fourteen members. The budget is presented annually to the Belgian Chambers, and voted by them; with the budget an annual report on the Congo Administration has to be presented. A railway connects Matadi and Stanley Pool. Another line, from Stanleyville to Ponthierville in the Upper Congo, was opened in 1906. The chief articles of trade are palm-oil, ivory, india-rubber, orchilla, beeswax, and different gums. Bananas and other tropical fruits are abundant.

Congo Snake, the name given by American negroes to *Amphiuma means*. [AMPHIUMA.]

Congregation (Lat. *grex*, flock), a collection of people or, indeed, other things. The word is used in the Universities to signify the body of regent masters of arts collected for voting and legislative purposes. It has also several ecclesiastical

significations. In Rome it denotes the several committees of the College of Cardinals for different administrative purposes, e.g. the Congregation of Rites. Again, convents may group themselves together to form a congregation. In Scotland it was used to denote the body of those who subscribed the Covenant of 1557, the nobles who adhered being called Lords of Congregation. It is also used to denote sometimes the habitual, sometimes the casual, body of worshippers in any church or chapel.

Congregationalist, applied as an adjective to a body of Christian worshippers who look upon themselves as forming a community exempt from any other ecclesiastical authority than their own united opinion, and as possessing equal rights one among another. As a substantive it denotes a member of such body. Other bodies than the nominal Congregationalists hold the same democratic form of church government.

Congress (Lat. *congregior*), a meeting of delegates for the purpose of discussing questions, with a certain power of adopting measures which depend for their validity upon subsequent ratification by the delegating bodies. The Congress of Vienna in 1814-15 is an instance in point. The congress exists in other than political matters; the Social Science Congress and the annual Church Congress are instances. In the United States of America the word denotes the central legislative body of the Union, consisting of the Senate and House of Representatives. The American Congress resembles, in many respects, in its functions and action the British Parliament, though many topics which come before the latter are, under a Federal system, reserved for the State Legislatures. An *Act of Congress* is a legislative enactment of the two Houses, ratified by the President.

Congreve, RICHARD, Positivist thinker, was one of Dr. Arnold's pupils at Rugby, where he subsequently became assistant-master. In 1855 appeared his well-known edition of Aristotle's *Politics*, and in 1857 his pamphlets on *Gibraltar* and *India*, in which he denounced the British Empire in the East. Resigning the fellowship that he held at Wadham College, he openly adopted the Positivist system about this time. Among his other writings are *Elizabeth of England*, *Our Foreign Policy*, and *Human Catholicism*. He died in 1899.

Congreve, WILLIAM, dramatist, was born in 1670 at Bardsey, near Leeds, and educated at Kilkenny and Trinity College, Dublin. He subsequently entered at the Middle Temple, and began to devote himself to literature. His first work was *Incognita*, a novel of an amusing character, and published under the pseudonym of Cleophil. In 1693 was produced the *Old Bachelor*, under the auspices of Dryden, between whom and Congreve there existed great friendship, and this met with a brilliant success. It was followed towards the end of the same year by the *Double Dealer*, whose reception, however, was not so happy. At the "theatre in Little Lincoln's Inn Fields" in 1695, *Love for Love* was brought out and obtained for its

author still higher popularity, which was, if possible, added to in 1697 on the appearance of the *Mourning Bride*, a tragedy. *The Way of the World*, 1700, was his last production for the stage, though he continued to write verses, and in 1710 he published a collection of his poems and plays. This he dedicated to Lord Halifax, who had been an early patron and useful friend. He amassed a fortune, which, on his death in 1729, he bequeathed to the Duchess of Marlborough.

Congreve, SIR WILLIAM, baronet, inventor of the rocket that bears his name, was born May 20, 1772. He began his career in the army, and in 1808 invented the Congreve rocket. He was elected a fellow of the Royal Society, and in 1812 was returned to Parliament for Gatton, succeeding his father in the baronetcy in 1814. He wrote *An Elementary Treatise on the Mounting of Naval Ordnance* (1812), and a *Description of the Hydro-Pneumatic Lock* (1815). He died in 1828 at Toulouse.

Coni, or CUNEO, a town of Italy, capital of the province of the same name, is situated in a fruitful region about 50 miles S.W. of Turin. It is a bishop's see, and its fine cathedral has been lately restored. The province covers an area of 2,756 square miles.

Conibos, a numerous South American nation occupying the valleys of the Western Peruvian Andes in the Upper Amazons basin; they are a branch of the widespread Antis family, and are described by M. P. Marcoy in *Tour du Monde*, vol. x. They are the *Conihuas* of the early Spanish writers.

Conicoid, or CONOID, is a surface any section of which is a conic. Of such surfaces the sphere is a special case; every section of this figure being a circle. The ellipsoid is another case; it sometimes being a circle. The cone is a special case; it has three perfect angles. The ellipsoid is an ellipsoid in every section. The ordinary cone is a cone in every section. In fact, every conicoid may be made a quadric we have the hyperboloid. Certain conicoids obtained by rotating a conic are termed conicoids.

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tapering form, branching freely in pseudo-whorls; leaves reduced to rigid needles, mostly evergreen; and unisexual, wind-pollinated flowers, the female ones forming a seed-bearing cone (q.v.). The wood, which often forms wide annual rings, has inconspicuous medullary rays, and consists mainly of tracheides with bordered pits. The leaves are broad in *Ginkgo* and *Arancaria*; deciduous in *Taxodium* and the larches; in whorls of three in juniper; and in clusters of two, three, or five, in the axil of a membranous scale-leaf in the pines. With the exception of the yew (*Taxus*) conifers abound in resin-passages both in their stems and in their leaves. There being no perianth or closed ovary, the ovules are naked, and the pollen-grain falls directly into the micropyle. The seeds are filled with archisperm, formed before fertilisation, and the cotyledons are often green before germination and deeply lobed, so that the order has been termed "polycotyledonous." Some species reach a large size, *Sequoia gigantea*, the Mammoth tree of California, attaining 450 ft. in height, with a diameter of 37 ft. at the base. Many kinds are valued as ornamental trees, and others yield turpentine, resin, pitch, oil, and timber. [CEDAR, CYPRESS, HEMLOCK SPRUCE, JUNIPER, LARCH, PINE, SPRUCE, etc.]

Conington, JOHN, scholar, was born in 1825 at Boston in Lincolnshire. Educated at Rugby under Dr. Arnold and Dr. Tait, he was elected scholar of Magdalen College, Oxford, in 1843, and of University College in 1846, where in 1848 he was elected to a Fellowship. He chiefly devoted himself to English editions of the classical texts, the chief of which was his *Virgil*, published in 1861-68. He also rendered the *Odes of Horace* and the *Æneid* into verse. He died in 1869, having held the appointment of Corpus Professor of Latin since 1854, the year of its foundation.

Conirostres, a lapsed group of Passerine birds having the beak strong and conical, without a definite notch in the upper mandible. The Sparrow, Hawfinch, and Lark, are examples.

Coniston, LAKE, in the county of Lancaster, England, is beautifully situated at the foot of Coniston Fells. It is five miles long, half a mile broad, and 260 feet deep. On its eastern bank stands Ruskin's house, Brantwood.

Coniston Beds, a great series of rocks upwards of 5,000 ft. thick, partly Ordovician and partly Silurian in age, which occupy a large area in Westmoreland. The lower division is the *Coniston limestone*, which rests on the great Ordovician volcanic series of the district. It contains corals, brachiopods, and trilobites, many of which are identical with those of the Bala limestone in North Wales, and in Furness it occurs as the *Ireleth limestone*. Above it comes a great series of dark grey coarse flags or sandy mudstones, the *Coniston Flags*, followed by tough sandstones and greywacke, the *Coniston Grits*. These beds contain graptolites and other fossils similar to those of the Denbighshire Grits and the Lower Wenlock series of the Silurian.

Conjugate, a term employed in geometry to denote certain pairs of points, lines, or surfaces that possess harmonic relations to each other. The harmonic conjugate of a point with regard to two others in the same line is that point the reciprocal of whose distance from the given point is the mean of the reciprocals of its distances from the other two. Conjugate diameters of a conic section are such that each is parallel to the tangents at the extremity of the other; each will bisect all chords parallel to the other.

Conjunction of two heavenly bodies occurs when the two are in the same meridian. If at the same time they have the same altitude they will be in a line with the earth. A body is in conjunction with the sun when it is in the same line with the sun and on the same side of the earth as the sun. It is in *opposition* when in the same line but on the other side of the earth. Thus the transit of Venus is the position of conjunction of that planet with the sun.

Conjunctiva, the mucous membrane of the eye and eyelids. It is described as being made up of three parts, named *palpebral*, *scleral*, and *corneal*. The *palpebral* conjunctiva lines the inner surface of the eyelids. The *scleral* conjunctiva is the portion which covers the sclerotic, the resistant supporting tissue of the eyeball, or "white of the eye" as it is termed. The *corneal* conjunctiva covers the anterior surface of the cornea, the transparent portion of the outer coat of the eyeball. These three portions are directly continuous with one another.

Conjunctivitis, or inflammation of the conjunctiva, is a very common affection. Several varieties of conjunctivitis are described. Catarrhal conjunctivitis ("blight") is peculiarly apt to affect children, and is, at any rate in some cases, contagious. The symptoms are photophobia (q.v.) and increased secretion. Purulent conjunctivitis is a much more serious disease in which the whole thickness of the conjunctiva is involved. There is no definite boundary line between severe cases of catarrhal conjunctivitis and slight cases of purulent conjunctivitis, but practically the two affections are sufficiently distinct and not apt to be confused one with another. One variety of purulent conjunctivitis is that which occurs in the new-born infant (ophthalmia neonatorum). If neglected it may lead to complete loss of sight. [BLINDNESS.] Other varieties of inflammation affecting the conjunctiva are phlyctenular conjunctivitis and granular lids. In the treatment of catarrhal conjunctivitis the main points to attend to are the improvement of the general health, and the frequent application of some mild antiseptic or astringent lotion. In many instances the vision will be found at fault, and it may be necessary for the child to commence the use of spectacles. In purulent conjunctivitis the adequate application of local remedies, and the thorough removal at frequent intervals from the conjunctival sac of the secretion which is formed, are matters of supreme importance. Medical advice should be procured from the outset, as a few hours'

delay in the treatment of acute purulent ophthalmia may mean the loss of eyesight.

Conkling, ROSCOE, politician, was born in 1828, at Albany, U.S. Educated for the law, he was in 1858 returned to the House of Representatives. In 1867 he became a senator, and in 1881 resigned owing to a dispute with President Garfield. Meanwhile, his influence in the ranks of the Republican party had grown to such an extent that he was able to divide the party into the "Conklings" and "Anti-Conklings," or the "Stalwarts" and "Half-breeds," or, again, the "Machines" and "Anti-Machines." After his resignation, however, in 1881 he took no prominent part in politics, and died in 1888.

Connecting Rod, in *Engineering*, is a bar of wrought-iron or steel used as an intermediate link to convert the alternating straight-line motion of the piston into the rotatory motion of the shaft. Its one end grasps a cross-head at the end of a piston-rod, the other end holding a crank-pin which travels in a circle by reason of its rigid connection with the driving-shaft.

Connective Tissue. The connective tissues serve as a kind of framework or basis on which the body is moulded or built up; they are disposed between the various muscular, glandular, and nervous structures, connecting them one with another, whence the name connective tissues. The connective tissues are developed from mesoblast [DEVELOPMENT]; they may be divided into three groups, connective tissue proper, cartilage (q.v.), and bone (q.v.). Connective tissue proper or fibrous connective tissue is made up of cells and intercellular substance. The chemical basis of the latter is composed of a material which yields gelatin on boiling. The cells are readily distinguishable on microscopic examination of such structures as tendon and cornea; while, to go to the other extreme, there are structures in which the matrix or intercellular substance reaches such a degree of development as to render it difficult to demonstrate the existence of cells at all. Several varieties of the connective tissues (apart from cartilage and bone) are described. White fibrous tissue occurs in tendons and fasciæ and beneath the epidermis; yellow elastic tissue is found in the coats of arteries and in certain elastic membranes; adenoid tissue is that which constitutes the framework of lymphatic glands; gelatinous tissue is found in the umbilical cord; and neuroglia in nervous structures.

Conoclypeidæ, an extinct family of irregular Sea-urchins [ECHINOIDEA], of much interest, as they are intermediate between the toothed and toothless forms. They are provided with powerful ossicles supporting the teeth, which are, however, diminished in size; these members of this family also possess the star-shaped structure known as the "floscelle," consisting of five ridges and five depressions, all of which radiate from the mouth. This floscelle is the typical character of the toothless order, Cassiduloidea, in which the genus *Conoclypeus* and its allies were included before

the discovery of the teeth. There are no British representatives of the family, which was most abundant in the Eocene period in Central Europe.

Conodonts, minute fossil tooth-like bodies, about a line in length, generally with acute denticles or serrated edge and mainly calcareous in composition, which occur in Cambro-Silurian and Devonian rocks in England, Russia, and North America. They differ from the minute jaws of annelids in being calcareous rather than horny, and are considered with some certainty to be the teeth of cyclostomatous or lamprey-like fishes.

Conoid, a special type of quadric surface, exemplified by the sphere, spheroid, and cone. [CONICOID.]

Conolly, JOHN, M.D., D.C.L., was born in 1795, and was educated for the medical profession at the University of Edinburgh. He settled in London, and devoted his attention to the treatment of insanity, as to which the public conscience was beginning to awaken. To him is largely due the more humane system now pursued in the management of lunatics. He was for many years physician to the Hanwell Asylum, the Asylum for Idiots, and other institutions. He wrote valuable works on the symptoms of madness, and the construction and management of asylums, besides contributing largely to scientific journals. One of his last literary efforts was a treatise on Hamlet's mental characteristics. He died in 1866.

Conrad, MARQUIS OF TYRE, son of William, Marquis of Montferrat, entered the service of the Pope Alexander III., and fought against Frederick I. In 1186 he went to Syria and took part in the Third Crusade. He was captured by Saladin, and received as reward the city of Tyre. He narrowly escaping capture, he fled to the city of Tyre, then besieged by Saladin. He was relieved by the arrival of Philip Augustus. Proclaiming himself King of Jerusalem, and would probably have been assassinated in the city of Tyre. He died in the city of Tyre.

Conrad I., son of the Emperor Frederick I., declined the homage of the Pope, and was crowned King of Germany. He died in 1152.

Conrad III., of the Hohenstaufen or Swabian dynasty, succeeded Lothaire III. as Emperor in 1138. Henry the Proud of Saxony was a formidable competitor, and the struggle between the Saxon house of the Guelphs (Welf) and the Franconian house of the Ghibellines (Wibeling) dates from this period. Conrad crushed his opponent in the battle of Weinsberg (1140), and subsequently joined in the Crusades with Louis VII. of France. After an unsuccessful attempt to take Damascus, he returned to Germany in 1149, was again victorious over the Guelphs, and died in 1152, leaving as heir his nephew Frederick Barbarossa.

their fiefs hereditary. He built the cathedral at Speyer, where he was buried in 1039.

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Conradin, or CONRAD V., son of Conrad IV., was only two years old at the death of his father, and was brought up by Louis of Bavaria. This ill-starred prince, the last of the Hohenstaufens, was stripped of his possessions by Manfred, who in his turn had to submit to the spoliation of Charles of Anjou, whom the Pope invested with the kingdom of Naples. At the age of 16 Conradin endeavoured to recover his territory in Italy, but was defeated by Charles at Tagliacozzo, captured, and put to death (1268). His mother, who brought a sum of money from Germany for his ransom, arrived too late. She built therewith the famous convent Del Carmine, where her son lies buried.

Consalvi, ERCOLE, CARDINAL, was born at Rome in 1757. Under Pius VI. and Pius VII. he rose to the highest dignities in the papal court, and was a firm opponent of the French Revolution and the rise of the Empire. In 1801 he was employed to negotiate the famous Concordat, and when his master found it impossible to keep terms with Napoleon, he insisted on being allowed to resign. During the abdication of Pius VII. he joined him at Fontainebleau, and on his return to Rome in 1814 resumed his duties as secretary of state. He represented the Holy See at the Congress of Vienna, and obtained valuable concessions for his government. He died in 1824, and was buried in the church of San Marcello at Rome. His memoirs possess considerable interest.

Consanguinity, or KIN, is the relationship existing between persons descended from a common ancestor. It cannot exist without a legal marriage. Consanguinity is either lineal or collateral. Lineal consanguinity exists between persons related to each other in the direct ascending line, as from son to father, grandfather, great-grandfather, etc., or in the descending line from great-grandfather to grandfather, father and son. Collateral kindred are those who, though they have the same blood derived from a common ancestor and are therefore *consanguineal*, do not descend one from the other. Thus brothers have the same blood and are descended from a common ancestor, but they are related to each other collaterally, and the children and descendants of each of them are all collateral kinsmen to each other. By the law of England, all persons related to each other by consanguinity or affinity nearer than the fourth degree of the Roman

law are prohibited from marrying except in the ascending or descending line (in which the case can hardly occur in the course of nature).

Conscience, HENDRIK or HENRI, was born at Antwerp in 1812, his father being French and his mother Flemish. In 1830 he entered the army, but the success of some popular songs by him led to his abandoning military life for literature. After a brief but painful struggle with poverty he produced in 1837 *In het Vonderjaer* (The Year of Miracles), a romance that met with great success, and encouraged his aspirations to make the Flemish language a literary instrument. *The Lion of Flanders* followed in 1838, and established his name. King Leopold looked with favour on his efforts, and not only gave him a professorship at Ghent, but appointed him also tutor to the royal family. In 1868 he became keeper of the Musée Wiertz at Brussels. Among his many works, several of which have been translated into English and French, the most remarkable are *A History of Belgium*, *The Executioner's Child*, *The Conscript*, *The Poor Gentleman*, *Blind Rosa*, *The Justice of Duke Katel*, and *The Peasants' War* (1879). He died in 1883. As a painstaking delineator of everyday life, a gentle and inoffensive humorist, and an enthusiastic cultivator of his native tongue, Conscience deserves high praise; but he lacked dramatic power and knowledge of character.

Conscience Money, an expression coined to represent sums sent anonymously to the Chancellor of the Exchequer by those who have unwittingly or wilfully defrauded Government of some of its dues. The name comes from the supposition that the sender of the money is impelled to this course by the stings of conscience. These stings are seldom so keen as to lead him to reveal his name.

Conscription (Lat. *conscribo*, to enrol), a word used to describe the varying conditions of compulsory military service. England, owing in a great measure to its insulated position and its small army, has for a long time had little practical knowledge of conscription. But during and since the South African war (1899-1902) its adoption has been strongly advocated by some authorities. A modified conscription existed earlier in the nineteenth century in the shape of the pressgang for the navy and the ballot for the militia (now the New Special Reserve). In Germany and France, where universal service, with a few exceptions, is obligatory, the practice weighs heavily, and though French patriotism makes it tolerable, German patriotism does not prevent many from avoiding their obligation by foreign residence. Conscription in theory seems just and reasonable, but practically it has many drawbacks, and may do much to hinder the trade of a country and the prospects of the conscripts.

Consecration, an ecclesiastical word of Latin derivation denoting the blessing or setting apart of a person, place, or thing for divine worship or other ecclesiastical purpose. The consecration is often solemnised by a bishop, as in the consecration of

bishops, priests, and deacons, or of a church or churchyard or cemetery. At other times the function is discharged by a priest, as, for instance, in the operative words of the mass or the communion service, or the blessing of holy water or incense.

Consequential. [DAMAGES.]

Conservation, in *Physics*, a term employed at present in three definite connections to signify the impossibility of altering the quantity of certain existences in the universe. Each of these existences may be distributed in different ways, but the total quantity thereof cannot be changed. Taking them in the order in which the enunciation of the doctrine of their conservation has been formulated, we have:

1. *Conservation of Matter*. This doctrine has been reached by the investigations chiefly of chemists. Matter exists in the universe in various forms and with unequal distribution. Whatever process obtains to change the distribution or the forms of matter, whether this process be natural or artificial, it cannot change the total quantity of matter. Thus the burning of a candle involves the combination of particles of candle with particles of oxygen in the surrounding air. There is thus a redistribution of the matter in the system, and portions of that candle pass away in various directions. But every particle still exists; none are annihilated and none created afresh. [MATTER.]

2. *Conservation of Energy*. Energy is generally defined as the power of doing work, and this definition may be here accepted, though from the principle to be enunciated it is obvious that to do work is merely to transfer energy. But whatever energy may be defined to be, the total amount in the universe is held to be constant. If, for instance, a machine has a certain amount of energy given to it, by no means can we make it give out more than that quantity. This we learn by experience, and we argue its truth by reason of the applicability of the doctrine of conservation of energy to every case where results obtained theoretically may be tested experimentally. The doctrine being true, it is impossible to construct a machine that shall be in continual motion and that shall also do useful external work. For if its energy is partially given away less must remain. If the withdrawal of energy is continuous, it must ultimately lose its energy and be therefore motionless. So perpetual motion, as understood by the old philosophers, is an impossibility. [ENERGY.]

3. *Conservation of Electricity*. This has only of recent years been advanced by physicists. Whatever electricity may be, whether according to the one-"fluid" theory its effects are observable wherever it exists in quantity above or below the average, or according to the two-"fluid" theory the effects are observable where the two opposing principles do not neutralise each other, this doctrine of conservation of electricity states that like matter its total quantity in the universe is invariable and that its distribution alone varies. [ELECTRICITY.] The question of conservation of force was investigated experimentally by Faraday, but the results did not lead to any new development. Force is not an existence but only a rate of change of energy. [ENERGY.]

under the council. It

Conspiracy, a combination or agreement between several persons to carry into effect a purpose hurtful to some individual or to particular classes of the community, or to the public at large; for example, to injure the public health by selling unwholesome provisions, to raise the funds by the propagation of false intelligence, to defraud some person or persons of his or their property, and the like, besides conspiracies to murder or to commit any other of the greater offences. One of the chief cases of this offence is that of falsely and maliciously conspiring to indict an innocent man. With respect to this offence of conspiracy in general (and not merely when it affects the administration of justice), it may be further remarked that it is deemed to consist rather in the guilty combination or agreement than in the act by which it is carried into effect, and therefore in an indictment for conspiring to do a thing in itself unlawful it has never been essential to allege that the thing was in fact done. A combination among workmen to raise the price of wages was once deemed to be a conspiracy.

though the same object if contemplated by a single workman would not have been criminal or even actionable. The law, however, as to efforts to obtain a rise of wages has been materially altered by the "Trade Union Act, 1871," which enacts that the purposes of any trade-union shall not, by reason merely that they are *in restraint of trade*, be unlawful, so as to render the members liable to prosecution for conspiracy or otherwise; and by the "Conspiracy and Protection of Property Act, 1875," an agreement or combination by two or more persons to do or procure to be done any act in contemplation or furtherance of a trade dispute between employers and workmen, shall not be indictable as a conspiracy, if such act committed by one person would not be punishable as a crime either by indictment or summary conviction.

Constable, an officer to whom our law commits the duty of maintaining the peace. The Constable of England or Lord High Constable, as he was called, was an officer of high dignity and importance in this realm about the time of Henry VIII., but since that period this particular office has been disused in England, except on great and solemn occasions. He was then the leader of the king's armies, and had the cognisance of all matters connected with arms and war. He also sometimes exercised judicial functions in the Court of Chivalry, where he took precedence of the Earl Marshal. His jurisdiction is partly now vested in the Court of Admiralty. Constables are of two sorts—*high constables* and *petty constables*; the former are appointed at the court leets of the franchise or hundreds over which they preside, or in default of that by the justices at the Quarter Sessions, and are removable by the same authority that appoints them. They have the superintendence and direction of all petty constables within their district, and are in some measure responsible for these latter. They have also other duties such as serving precepts and warrants on certain occasions. But the utility of these officers having become questionable, the justices of each county were directed by statute 32 and 33 Victoria, c. 47, to consider and determine whether it was necessary that the office of high constable of each hundred or other like district within their jurisdiction should be maintained, and provision is therein made for the abolition of such office in certain cases and for the transfer of the duties thereof to the clerk of the justices in each sessional division. The duties of petty constables are subordinate to those of the high constable, and of a less important character. There are also constables of castles, who are governors or keepers of the same, and whose office is usually honorary. [POLICEMAN, WARRANT.]

Constable, ARCHIBALD, was born at Carnbee, Fifeshire, in 1774, and was apprenticed early to a bookseller in Edinburgh. He took great interest in the business, being an assiduous collector of rare works bearing on Scottish history or literature. In 1796 he started on his own account as a publisher, and his liberality soon made him popular with authors. *The Farmers' Magazine*, *The Scots'*

Magazine, *The Edinburgh Review*, *The Encyclopædia Britannica*, *The Annual Register*, and *Constable's Miscellany* were brought out by him, together with important works by Dugald Stewart, Playfair, Brown, and Leslie. But his greatest title to fame rests on his connection with Sir Walter Scott, which dated from 1802, when the *Minstrelsy of the Scottish Border* was produced, and extended until 1827, the date of his death. During the greater portion of this long period the relations between the author, the publisher, and Ballantyne, the printer, were quite amicable and straightforward. Scott, however, having inextricably involved himself with Constable, appears to have desired to free himself from his obligations, and to start a new business with John Ballantyne, the printer's brother, as its nominal head. The scheme ended in failure, and Constable generously rescued the partners from immediate disaster, but the commercial depression of 1825 overtook them all, and bankruptcy ensued, the liabilities amounting to a quarter of a million. Constable's health broke under the shock, and he died in 1827. [SCOTT, BALLANTYNE.]

Constable, HENRY, born of a Roman Catholic family in Yorkshire about 1556, was educated at St. John's College, Cambridge, where, in 1579, he is thought to have produced the romance in verse and prose entitled *The Forest of Fancy*, and bearing the initials H. C. In 1592 appeared a volume of sonnets called *Diana*, displaying great power and skill, and three years later he wrote four splendid sonnets as an introduction to Sidney's *Apology for Poetry*. Suspected of treasonous correspondence with Mary Queen of Scots, he fled abroad, and roamed for several years in France, Italy, the Low Countries, and Scotland. In 1601 he returned to England, and was forthwith consigned to the Tower, but obtained his release in 1604. He died some time before 1616. "Diaphenia like the Daffadownilly" with "Venus and Adonis" and two other of his poems were printed in *England's Helicon* (1600). His *Spiritual Sonnets* saw the light quite recently, and there are unpublished poems of his still in existence.

Constable, JOHN, the son of a yeoman farmer at East Bergholt, Suffolk, was born in 1776. He acquired some knowledge of drawing and painting from Dunthorne, an intelligent plumber, but his father kept him at agricultural work until 1795, when Sir George Beaumont sent him to London with an introduction to Farington. His talents were recognised, but he made slow progress. He exhibited in 1802, but it was only in 1811 that his picture of *Dedham Vale* attracted favourable notice. The knowledge of nature stored up in early life, and the laborious industry with which he essayed to reproduce on canvas the scenery of his native county now began to tell. In 1818 he had four fine works, including the *White Horse*, in the Royal Academy Exhibition, and was elected an associate. *Stratford Mill*, *The Hay Cart*, and *Salisbury Cathedral* were among his masterpieces at this period, and some of his works exhibited in Paris created a profound sensation, and won him

two gold medals. In 1825 he painted *The Lock*, one of his most characteristic pictures, and *The Cornfield*, produced in the following year, showed his powers under another aspect. In 1829 he was elected a Royal Academician in spite of much opposition. *The Valley Farm*, *The Rainbow*, and *Waterloo Bridge* are the chief specimens of his later manner. Whilst working with Lucas at his book of *English Landscape Scenery*, he broke down in health, and during the last four years of his life was a martyr to rheumatism and other ailments. In 1836 he lectured on art at the Royal Institution, but died suddenly in 1837. Truth to nature in tone rather than in detail was the aim of his endeavour, and an age that was dazzled by Turner's brilliant idealism did him but scant justice, especially as he confined himself within a somewhat narrow field. He was more generously appreciated in France; still his great merits never obtained recognition until years after his death. Enormous prices have recently been given for the best examples of his genius.

Constance, or KOSTNITZ, a city of the Grand Duchy of Baden, capital of the circle that bears its name, stands on the S. bank of the Rhine at its exit from the Lake of Constance. It was probably founded in the third or fourth century A.D., and in the sixth century became the seat of the Bishop formerly established at Windisch. The old walls still mark the limits of the ancient settlement, but the houses now extend into the large suburbs of Brühl, Kreuzlingen, Paradies, and Petershausen. Becoming an imperial city it rapidly rose in wealth and importance. The Gothic cathedral dates from the eleventh century, and many fine specimens of mediæval architecture, such as St. Stephen's church, the Dominican convent, the public mart, and the town hall, still adorn its streets. Here sat the famous council (1414-1418) that sent John Huss and Jerome of Prague to the stake. Constance was annexed by Baden in 1805, and was secularised. The city is connected by railway with Germany, and has factories for silk and watches.

Constance (Bodensee), lies on the N. of Lake Constance, in the Grand Duchy of Baden, but is mostly in the territory of the Kingdom of Württemberg. It has an area of about 200 sq. miles, and is as long by 9 miles broad. The lake is 9 miles broad at its widest point, and 1,300 ft. above sea-level. The lake is divided into two parts by the Untersee and the Obersee. The lake is mostly frozen in winter, save at the mouth of the Rhine, where it remains open again at the end of the year.

Constance was one of the most important cities of the Empire in the Middle Ages. It was the seat of the Bishop of Constance, and was a member of the Holy Roman Empire. It was destroyed by the French in 1805, and was annexed to Baden. It was a member of the German Confederation, and was a member of the Zollverein.

The best known specimens of his style are *Femmes du Riff*, *Le Harem*, *La Favorite de l'Emir*, *La Vengeance du Chérif*, and a huge canvas displayed in the International Exhibition of 1878 and entitled *Mahomed II., le 29 Mai, 1453*, for which he received the Cross of the Legion of Honour. He painted several fine portraits, and occasionally abandoned his favourite field for other subjects such as *Orpheus* and *Theodora*. He died in 1902.

Constant de Bebecque, HENRI BENJAMIN, was born of French Protestant parents at Lausanne in 1757. He studied at Oxford, Erlangen, and Edinburgh, making at the latter University the friendship of Erskine and Mackintosh. Going to Paris before the Revolution he allied himself with the chief liberal thinkers, and in 1795 settled down there as a supporter in the Assembly and in the press of moderate republicanism. Napoleon expelled him at the same time as his friend Madame de Staël in 1802, and he then found shelter at Weimar, where he enjoyed the society of Goethe and Schiller, translated *Wallenstein*, and wrote his romance *Adolphe*. The fall of the Empire brought him back to Paris, where he somewhat inconsistently supported the Bourbons at first, gave in his adhesion to Napoleon during the Hundred Days, and then yielded his allegiance to the restored king in 1815. Constant was in fact prepared to support a constitutional government under any leader, and to advocacy of his moderate views he devoted the rest of his life. Opposed to the reactionary policy of Charles X., he warmly approved of the offer of the throne to Louis Philippe, and became the president of the council, but died in 1830 immediately after the change of dynasty. His greatest work, *On Religion, considered in its Source, its Forms, and its Developments*, is a philosophical attempt to trace the various phases that religious sentiment has passed through in the history of mankind. It shows no open hostility to Christianity, but repudiates the supernatural in all creeds alike. His various political writings are summed up in his *Cours de Politique Constitutionnelle*. As a debater and a talker he outshone most of his contemporaries. Many of his speeches, pamphlets, and letters have been published posthumously.

Constantia, a village in Cape Colony, South Africa, 12 miles S. of Cape Town, and under the E. flank of Table Mountain. The cultivation of the grape was started here early by the Dutch, and the district is celebrated for the rich, sweet wine that bears its name.

Constantina, a town in the province of Seville, Spain, 40 miles N.E. of the capital, and near the Sierra de Constantina, the range that separates Andalusia from Estremadura. The place is defended by a strong castle. It produces soap and leather goods, and has in its neighbourhood mines of silver-lead.

Constantine, the capital of the province of the name in Algeria, stands about 50 miles inland from the port of Philippeville on the site of the ancient Cirta, and occupies a rocky height, 2,100

feet above sea-level, being cut off on three sides by a deep ravine, through which flows the Rummel. The original town was destroyed by fire in 311 A.D., and Constantine the Great, who rebuilt the place, gave it his name. The stones of the existing walls, the old bridge over the ravine, a part of the kasba or citadel, now a hospital, are Roman. The streets and houses of the oriental town as it existed before French occupation are tortuous, dirty, and dilapidated, but the modern quarter is well laid out with broad thoroughfares, trees, and fountains. The Place Nemours and the Place du Palais are fine squares. Among the public buildings are the mosque of Souka-er-Rezel (1143), now transformed into a Catholic church, that of Sidi-el-Kattani, the great mosque (Djama-Kebi) on the site of an ancient Pantheon, the harem of Salah, and the town-hall. There are the usual schools, hospitals, and other buildings of a provincial capital. A considerable trade is carried on with the coast and the interior, and the chief manufactures are woollen goods and saddlery. Originally the residence of the kings of the Massylii and the birthplace of Massinissa and Jugurtha, it declined under Rome. Cæsar gave a part of the territory to Sittius, who founded the Colonia Sittianorum. It was destroyed in the rebellion of the usurper Alexander against Maxentius. Passing into Turkish hands, it became the seat of a bey under the Dey of Algiers, but in 1826 asserted its independence, which it maintained until conquered by Marshal Valée in 1837. The province has an area of 67,576 square miles, and is bounded E. by Tunis.

Constantine, the name borne by thirteen emperors who reigned at Rome or Byzantium between 306 and 1453 A.D., and of whom the most important were:—

Constantine I., FLAVIUS VALERIUS AURELIUS, surnamed "the Great," was born in Moesia in 274, being the son of Constantius Chlorus and the low-born Helena. He spent his youth in the service of Diocletian, and won high military distinction in the East, whilst his father was acting as vice-emperor in the west. On the abdication of Diocletian and Maximian (305), he joined Constantius at Boulogne, went with him to Britain, and, on his death at York, in 306, accepted the nomination of the army to his father's vacant throne. Galerius, however, refused to recognise him as Augustus, but allowed him the title of Cæsar. He married Fausta, the daughter of Maximian and sister of Maxentius (307), both of whom laid claim to the purple, as did also Galerius, Licinius, and Maximin. Maximian, having acted treacherously towards his son-in-law, was first dealt with, and, having been defeated at Marseilles (310), committed suicide. Constantine next invaded Italy, routed and killed Maxentius at the Milvian Bridge (312), and became master of Rome. It was in this expedition that the conqueror professed to have seen the cross in the sky with the inscription "In this conquer," and to have been converted to Christianity. Whether he was at any time a true believer is doubtful, but at all events in 313 he restored to Christians their rights, and secured for them

toleration. For many years, indeed, until the Council of Nicæa in 325, he gave his support equally to Christianity and paganism, influenced, perhaps, by political considerations. It must be admitted, however, that all his reforms had a Christian tendency, though his personal conduct was far from being modelled on the lines of the Gospel. His adoption of the *Labarum* as his standard certainly dates from a later period. In 312 he engaged in hostilities with Maximin, who was crushed at Heraclea and destroyed himself. Galerius being dead, the empire was now divided between Constantine in the West and Licinius in the East. The latter married his colleague's sister, but in spite of this a war broke out in 314, and he was deprived of Illyrium, Pannonia, and Greece. For nine years there was peace, during which Constantine's wise policy strengthened and consolidated his dominions. Upon some obscure pretext Licinius was attacked and defeated at Adrianople in 323; Byzantium fell; the eastern empire was added to that of the west; and the victor assured his position by meanly slaying his vanquished rival. Though the remainder of his reign was exempt from war, it was stained by terrible bloodshed. His eldest son Crispus was put to death on a charge of treason and suspicion of incest. Fausta was killed for having falsely made the latter accusation, and the emperor's nephew, Licinius, perished in the same imbroglio (324). In 325 the Council of Nicæa was convoked, and Constantine henceforward showed more decided sympathy with the Church, though he looked on the dispute between Arians and Athanasians with the eye of a Gallio. The new capital was founded at Constantinople in 328, no pagan temple being permitted within its walls, and the city was dedicated to the Virgin in 330. Nothing worth record occurred in his later years. He was on the point of setting out to punish the rebellious king of Persia, when he died at Nicomedia in 337. He received the honour of apotheosis from his pagan subjects and of canonisation from the Church. His empire was divided between his three sons Constantine II., Constans, and Constantius.

Constantine VII., FLAVIUS PORPHYROGENITUS, the son of Leo VI. and his concubine Zoe, was born in 905 A.D. At the age of six he lost his father, and his father-in-law Romanus Lecapenus became his colleague and virtually his master until 944. The sons of Lecapenus then expelled their father, and were themselves banished by Constantine, who at last assumed his proper position. Though a weak ruler, he was a patron of literature and art, and he wrote a number of valuable treatises giving a fair idea of the times in which he lived. These include an account of the provinces of the empire and of the outlying nations, a system of administration, a description of the customs of the Greek Church and Court, two essays on military subjects, and a variety of other works. He was poisoned by his son Romanus in 959.

Constantine Nicolaievitch, the second son of the Czar Nicholas, was born in 1827, and,

having been trained by Admiral Lütke for the naval service, became grand admiral whilst a mere boy. He married in 1848 Princess Alexandra of Saxe-Altenburg. A strong supporter of the "Old Russian" party and a promoter of the war of 1854-6, he held command of the Baltic fleet at that period, and was successful in preventing any serious operations on the part of the Allies. In 1862 he became governor of Poland, and from 1865 to 1881 was President of the Grand Council of the Empire. In the latter year he was dismissed owing to a suspicion of revolutionary intrigues, but was subsequently restored to comparative favour. A life

deprived him of all his offices and sent him into retreat at Bialystok, where he died of cholera in 1881.

Constantinople (Turk. *Stamboul* or *Istamboul*), the capital of the Turkish Empire, was founded by Constantine on the site of the ancient Megarian colony of Byzantium (q.v.) in the year 330 A.D., and was designated by him "New Rome," a title that is still preserved in ecclesiastical phraseology. The Turkish name is said to be a corruption of the Greek words *εἰς τὴν πόλιν* (*eis tēn pōlin*). Constantinople proper or Stamboul



CONSTANTINOPLE. THE GOLDEN HORN.

of great irregularity and impaired health attending the ravings of madness.

Constantine the Czar Paul, the military prince of Italy in 1799, and Austerlitz in 1805, he was appointed

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stands on a promontory at the west of the entrance to the Bosphorus, being washed to the south by the Sea of Marmora, and to the north by the Golden Horn, an inlet said to derive its name from the shape of its antler-like branches, and sufficiently capacious to afford anchorage to the largest navies of the world. On the opposite side of this creek lie the large quarters of Galata and Pera (q.v.). The extreme eastern point of the promontory is occupied by the old Seraglio, which fills the place of the ancient Greek acropolis. Of the walls raised by Constantine no trace remains. They were built and manned by 40,000 Goths, who, as Arians, were not allowed within the Holy City, but lived in a district named Hexe-Kionia or Hexe-Marmora, an appellation preserved to this day in the form Altimermer. The existing walls date from Theodosius II. (412), but were completed by various hands at different epochs. They consist of two inner lines with an outer ditch and rampart, and at intervals of fifty yards are strengthened by towers. The vast subterranean reservoirs are contemporary with these works. The position of the Imperial palace is marked by the mosque of

Ahmed, but in the 12th century the court was transferred to Blachernæ in the north-western quarter. The main streets are identical with those laid out by Constantine, and retain some traces of the ancient arcades. The city comprises like Rome seven hills with dividing valleys, and among the more important secular buildings or monuments may be noted the Babi Ali or Sublime Porte, or landward gate of the Seraglio, used as a synonym for the Ottoman Court, the Burnt Column, and that of Constantine, under which the instruments of the Crucifixion and the Palladium of Troy are said to be buried, the Seraskierate or War Office, the Aqueduct of Valens, the At or Horse Bazaar, the Fire Tower, the Maiden's Column, once dedicated to Venus, the Church of the Patriarchate, the palace of the Hebdomon, and the Pentapyrgion. Of the four or five hundred mosques included within the walls, many are desecrated Christian churches. Chief among these must be reckoned the mosque of St. Sophia or Aya Sofia Jamisi, begun in 532 on the site of an older structure reared by Constantine. Huge, unsymmetrical, and barbaric externally, the grand proportions of the dome, 180 feet high and 107 feet broad, the many-coloured marbles and mosaics that adorn the interior, and the columns pillaged from the noblest temples of Greece, Asia, and Egypt, render it one of the most remarkable examples of the Byzantine style. Brick is the chief material used in the construction, pumice stone for its lightness being largely employed in the upper part of the dome. Two bridges span the Golden Horn; the outer one—that of Karakeui—is comparatively modern; the inner or old bridge, though now rebuilt in iron, was originally constructed by the Sultan Mahmoud. The space between the two forms the commercial harbour, the port of war being situated higher up in front of the arsenal which stands on the Galata side. A large import and export trade is carried on chiefly by foreigners, the produce of the coasts of Asia Minor and the Black Sea, such as wool, mohair, skins, and grain, being exchanged for European manufactures. The bazaars are large and numerous, and there are many *khans* or warehouses. Steamers keep up communication with all the ports of Europe, and ply frequently to and from the suburbs and adjacent coast towns. In addition to the primary and provincial Mohammedan schools and religious seminaries, Government institutions exist for training students for the military, naval, engineering, and medical professions. The *Imarets* or poor-houses, about 300 in number, deserve notice. Of late years considerable improvements have been effected in the lighting and paving of the streets, and a tolerably efficient fire-brigade has been established. No city has been more sorely tried by war than Constantinople. In the fifth and sixth centuries it was frequently threatened, but not actually attacked by barbarian invaders. Between 668 and 782 it was thrice besieged by the Arabs. The Russians made four attempts on its walls in the two succeeding centuries. Then ensued the struggle for its possession between Greeks and Latins, and it was captured by Dandolo and Michael Palæologus. Lastly, after these assaults

by the Turks it yielded to Mahomet II. in 1453, when the dispersion of its citizens and of its literary treasures brought about that great revolution known as the Revival of Letters. [BYZANTINE EMPIRE and ARCHITECTURE, GALATA, SCUTARI, TURKEY.]

Constantius, FLAVUS VALERIUS, often called Chlorus (*pale*), was born about 250 A.D., being the son of Eutropius, a noble Dalmatian. He was a soldier of high repute, and received the government of his native province. In 292 Diocletian and Maximian conferred on him as on Galerius the title of Cæsar, and assigned to him the administration of Gaul, Spain, and Britain. He then divorced his wife Helena, and married Theodosia, Maximian's daughter, who became the mother of Constantine the Great. He succeeded Diocletian as emperor, and was proclaimed Augustus in 305, but died at York the next year.

Constants, in *Mathematics* and *Physics*, are those quantities which remain of the same value throughout the case studied. In discussing, for example, the motion of bodies on the earth's surface, the attraction due to gravity is very nearly constant, and will therefore produce a constant acceleration. But in discussing the effect of the earth's gravitation on other heavenly bodies the intensity of this acceleration varies; it can no longer be treated as a constant. The period of a sidereal day is almost exactly a constant, and it is by referring to such quantities, whose unchangeableness may be relied upon, that we are able to express the magnitudes of similar quantities in terms of a definite number of absolute units. If this day varied in duration, it would be a matter of difficulty to obtain a convenient standard unit of time. This illustrates the importance of such physical constants.

Constellations, the groups into which the stars have been divided by astronomers. Many of them, such as the Pleiades, Orion, and the Great Bear, were identified and named in early times. Ptolemy enumerates forty-eight constellations in his *Almagest*, twelve of which are in the zodiac, twenty-one in the northern celestial hemisphere, and fifteen in the southern. Some of the old ones have since been changed, and several new ones added. [STAR.]

Constipation, an undue retention of the contents of the lower bowel. In the healthy individual an evacuation of the intestinal contents should occur once daily and at a definite time of the day. Irregularity in this particular should on no account be permitted, for unless the habit of regulating the action of the bowels is acquired, a condition of "sluggish action of the bowels" or habitual constipation is apt to be set up, which engenders headaches and dyspeptic troubles innumerable. Unfortunately the remedy for such a condition of things is too often imagined to be the continued administration, as occasion demands, of some favoured form of pill, which, it is true, obviates the difficulty for a time, but which only leads to a continued recurrence of the trouble, and to the employment of more and more violent means of

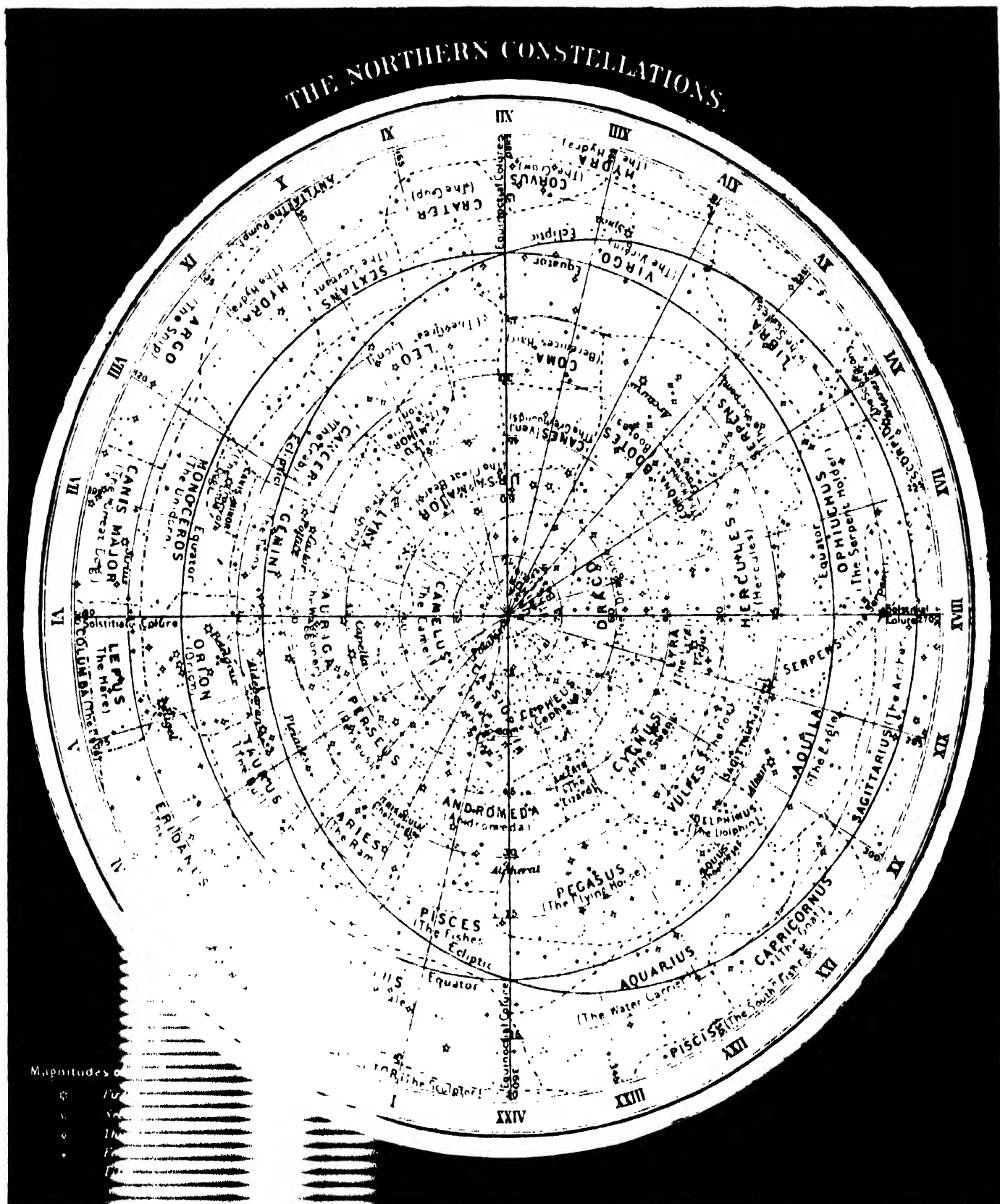


CHART SHOWING THE NORTHERN CONSTELLATIONS.

securing the desired result, as the normal functions of the body are more and more perverted and interfered with. Given a condition of habitual constipation, the treatment should consist in a deliberate attempt on the part of the patient to effect a return to the natural condition of things, and the adoption of certain hygienic and dietetic rules will be of far more service than the employment of drugs. Chronic constipation is often found in those who lead a sedentary life, and some amount of regular outdoor exercise is useful in such cases; a morning bath is said to be beneficial. Slowly sipping a glass of water—on first rising in the morning—is of undoubted service; oatmeal, brown bread, or fruit should be liberally included in the daily dietary. Fruit may, with special advantage, be taken either before or with the morning meal. If the case is an obstinate one, it may be necessary to have recourse for a while to mineral waters, or to some such drug as that now very largely used, the liquid extract of cascara sagrada (dose, half a drachm for an adult). But such measures should be regarded as only temporary, and should in no way be allowed to interfere with the cultivation of regularity of habit. An occasional attack of constipation is most efficiently treated by half an ounce of castor oil or by a ten-grain dose of the colocynth and hyoscyamus pill of the British Pharmacopœia; in some instances an enema is of service; but none of these remedies should be habitually employed. The compound liquorice powder and Gregory's powder are useful aperients of a less active stamp than those already mentioned. In the case of children the routine use of drugs is especially to be avoided; for occasional employment a small dose of castor oil or a combination of grey powder and compound rhubarb powder may be recommended.

Constitution, in a political sense, is the general arrangement of a community of the principles which should govern its administration, and which should be carried out without some great internal defect. In England, hereditary monarchy is the principle, responsibility of ministers is the principle, fundamental constitution is the principle, a great measure of spontaneous action is the principle, constitution is of some limits, and its name is a "hockey" for purposes of party. However, have for a general sense the fundamental principles applied in the administration of the state.

Consul, in a political sense, is the office of the consul in a foreign port, town, or country, who is accredited by another country to represent its interests and to protect its subjects in such foreign land, and who exercises his functions by permission of the community to which he is accredited. Often the consul is replaced by a vice-consul, who is a native of the country in which he exercises his functions, and is connected with the country which he represents by mercantile transactions or the like. Consulships are of varying importance and emolument, and the duties are various, being of great number and importance where the consul is the only representative of a country. One of his ordinary duties is to report from time to time any circumstances he may observe as likely to affect the well-being, commercial or otherwise, of the country he represents. The title of First Consul was bestowed upon Napoleon the First before his assumption of Imperial rank.

formula "*videant consules ne quid respublica detrimenti capiat*" ("let the consuls take measures that the commonwealth take no hurt"). In late times the consulship became a merely complimentary office. In modern times the consul is an officer in a foreign port, town, or country, who is accredited by another country to represent its interests and to protect its subjects in such foreign land, and who exercises his functions by permission of the community to which he is accredited. Often the consul is replaced by a vice-consul, who is a native of the country in which he exercises his functions, and is connected with the country which he represents by mercantile transactions or the like. Consulships are of varying importance and emolument, and the duties are various, being of great number and importance where the consul is the only representative of a country. One of his ordinary duties is to report from time to time any circumstances he may observe as likely to affect the well-being, commercial or otherwise, of the country he represents. The title of First Consul was bestowed upon Napoleon the First before his assumption of Imperial rank.

Consumption, a popular term which may be considered as the equivalent of phthisis pulmonalis, one of the most fatal diseases in many parts of the globe, and notably so in this country. The mean annual death-rate from phthisis amounts to about two per 1,000 living persons; perhaps a better idea of the ravages worked by the disease may be obtained from a statement of the result of an elaborate calculation made from the Registrar-General's returns, which is that of 1,000,000 children born upwards of 114,000 die of phthisis. The growth of knowledge as regards the disease has been attended by many changes in nomenclature, and it may be well to briefly discuss the meaning of such expressions as consumption, phthisis, tubercular disease of the lungs, bacillary phthisis, and the like.

The term consumption was originally somewhat indiscriminately applied to several forms of disease in which wasting or emaciation was a prominent symptom. The patient was said to be consumptive, to be in a decline, or to be suffering from phthisis (a word derived from the Greek and signifying a consuming or wasting away). Inasmuch, however, as loss of flesh is a phenomenon common to so many forms of disease, in order to be more precise it became customary to indicate the particular part of the body which was supposed to be especially involved by the morbid process. Thus we still hear the expressions consumption of the bowels and consumption of the lungs (pulmonary consumption) used; and the terms phthisis laryngea and phthisis pulmonalis are not infrequently employed, to indicate that the main symptoms present point to implication of the larynx or of the lungs respectively.

The study of morbid anatomy revealed the fact that the progress of "phthisis" was in many instances associated with the development of what were called "tubercles." These tubercles were studied for the most part as they appeared in the lungs, and they were described as being of two

varieties, the grey miliary tubercle and the yellow cheesy tubercle. Laennec maintained that tubercles were deposited from the blood, that at first they formed minute grey rounded semi-transparent masses (miliary tubercles), and that these by their coalescence and by the occurrence of degenerative processes gave rise to the opaque yellow masses. From the resemblance of the latter to cheese the degenerative process was spoken of as caseation. Laennec's views met with much opposition, it being held that the sequence of events detailed by him only obtained in a limited number of instances, while it was maintained that in many cases the caseous masses resulted from chronic inflammation of the lung substance, altogether apart from the deposit of miliary tubercle. The application of the microscope to the study of the diseased tissues threw further light on the matter, and for a while it was held that true pulmonary phthisis was distinguishable in all cases by certain definite microscopical appearances, the most characteristic of which was the presence in the midst of the growing tubercle of what was known as a "giant cell." Difficulties presented themselves, however, in connection with this solution of the question, and until a few years ago it was still maintained by many that the tubercle was the result of previous inflammation, and not that, as Laennec held, the inflammatory processes were caused by the deposit of tubercle. In other words, Laennec's attempt to define the condition of things by the naked-eye appearances of the diseased lung, and the further attempts to define it by the special microscopic appearances, were held not to cover all the ground, and something was yet wanting to establish the new species of disease. Meanwhile, the inoculability of tubercle was demonstrated, its infectious nature began to be discussed, and at length came the discovery which seems to have solved the problem. Koch in 1882 announced that the disease was due to a micro-organism, the bacillus tuberculosis. The new test was soon found to eclipse all that had preceded it, countless observers have verified by the methods elaborated from that originally employed by Koch, the invariable presence of this bacillus in the affected tissues in the type of malady under consideration; much attention has recently been given to the "open-air treatment" of the disease, and in 1902 a large sum of money was given to the King of England, who devoted it to the establishment of hospitals where consumption could be treated according to the most recent theories.

Of course it must be borne in mind that the bacillus tuberculosis attacks other organs besides the lungs. In other words, the lung disease is part and parcel of the general affection tuberculosis. Still, for convenience sake, it is well to adopt a term for those instances where lung symptoms predominate, hence the retention of the expressions *phthisis pulmonalis* (or simply *phthisis*) and *pulmonary consumption*. If it be desired to indicate that the disease is associated with the presence of Koch's bacillus, the adjective *bacillary* is sometimes employed, to exclude certain maladies in which wasting accompanies lung disease, and there is no evidence of the existence in the diseased tissues of the typical micro-organism.

Causation. Few situations are absolutely free from phthisis. On the whole it is more common in temperate climates than in very cold or very hot regions. Mountainous districts often enjoy comparative immunity, and the researches of Buchanan and Bowditch have proved the common association of marked prevalence of the disease with dampness of soil. As regards sex, males are more frequently affected than females, if ages between five and twenty-five years, in which the reverse holds, be excepted.

The disease affects persons of all ages; very young children are, however, rarely attacked, and the mortality is at its maximum in people between 35 and 45 years of age. Heredity appears to act as a predisposing cause. The influence of occupation is marked; those employed indoors in crowded workrooms, and persons exposed to an atmosphere charged with mineral or organic dust, are specially liable to attack. Insufficient ventilation is known to be a factor of immense importance apart from other defects, as is clearly shown by the evidence afforded by barrack rooms, back-to-back houses, and the overcrowded alleys and courts of great cities. Phthisis has been attributed to the consumption of the milk and flesh of animals affected by the bacillus, and probably with justice. The relative immunity of the Jewish race may be alluded to in this connection. As regards the influence of season of the year, it may be remarked that the largest number of deaths occur in the spring months.

Symptoms. The most common early symptoms are cough and loss of flesh. There may be spitting of blood, and sometimes an attack of hæmoptysis (q.v.) is the earliest indication to cause alarm; the larynx may be involved almost from the first, giving rise to loss of voice; vomiting sometimes occurs, and some febrile disturbance may be noted. The symptoms of the established disease are continued cough with mucopurulent, perhaps blood-stained, expectoration, hectic fever, with night sweats, and rapid loss of flesh. The circulation is enfeebled, dropsy may be present in slight degree, and a characteristic clubbed condition of the ends of the fingers is frequently produced. Diarrhoea may be exceedingly troublesome. The patient is often exceedingly hopeful as to the result of his illness, even when his condition is obviously becoming more and more serious.

The development of tubercle elsewhere than in the lungs may considerably modify the aspect of the disease; laryngeal, cerebral, renal, and peritoneal complications may be specially alluded to. The physical signs of consumption cannot be discussed here in any detail. Suffice it to say that tubercular mischief is more apt to occur at the apices than in other portions of the lungs. If râles are detected on auscultation over the upper parts of the lung on either side and remain limited to such situation, the circumstance is regarded with the utmost suspicion. When the tubercular infiltration has made some progress, and when the affected portions of lung commence to break down with the formation of cavities, definite alterations in the percussion note and character of the breath

THE SOUTHERN CONSTELLATIONS.

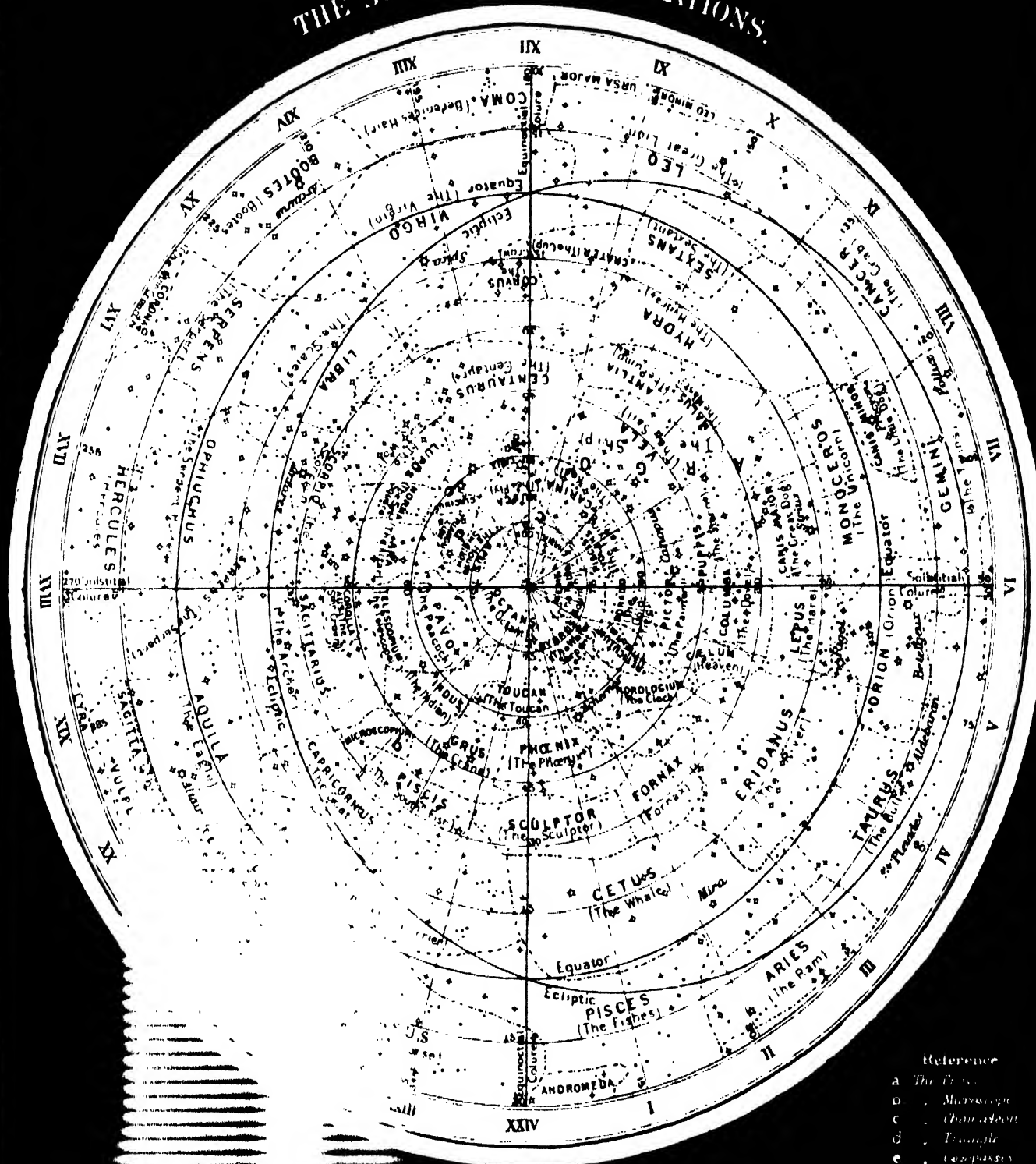


CHART OF THE HEAVENS SHOWING THE SOUTHERN CONSTELLATIONS.

MADE BY SOLAR JUNE BARADUR.

and voice sounds heard over the site of the mischief occur. The diagnosis is definitely confirmed in many instances by the discovery of the presence of the tubercle bacillus in the sputum.

The treatment of phthisis may be considered under two heads: preventive and curative. Preventive treatment will doubtless receive much more attention in the immediate future than has hitherto been accorded to it. The remarkable reduction of the phthisis death-rate in the army as the result of the adoption of improvements in ventilation and of an increased allowance of cubic space per head in barracks points in an unmistakable manner to the desirability of devoting attention to such matters. Moreover, phthisis is an infectious disease, and should be treated as such. Next to nothing is being done at the present time in the way of securing the disinfection of sputum, and the question of the communicability of the disease through the medium of milk, meat, and the like is only just beginning to force itself to the front. As regards curative treatment, it is now fully recognised that consumption in its early stages at any rate is not necessarily a fatal disease; much depends, however, upon the circumstances of the patient. If he can be removed to favourable hygienic surroundings, and can be well fed and cared for, there is a considerable chance of arresting the progress of the mischief. It is obvious, however, that to winter in a mild climate, or to go on a sea voyage, are plans of treatment beyond the reach of the majority of sufferers. In the case of workers in towns of scanty means the conditions are, it must be confessed, very unfavourable; still even here if the disease be incipient, and the best precautions available be taken, a successful result may be hoped for.

Since the establishment of the bacillary origin of the disease many attempts have been made to devise some plan which should prove fatal to the microbe, and thereby save the patient. The treatment of phthisis seems to have been the latest method devised, and it is to be hoped that it will have been somewhat successful. The Sanatoria or Cottages of the Tubercular Local Government have been founded by the

Contagion.

Contarini.

Venice, Italy, was the birthplace of a famous family of Venetian professors. Contarini, Giovanni, born in 1367, died in 1429. He was a statesman and a scholar. He died in 1429, and was buried in the church of Santa Maria della Salute. He was a member of the Council of Ten, and was one of the founders of the Republic of Venice. He was a great statesman and a great scholar. He was a member of the Council of Ten, and was one of the founders of the Republic of Venice. He was a great statesman and a great scholar. He was a member of the Council of Ten, and was one of the founders of the Republic of Venice.

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to return a writ, are punishable by attachment, but contempts committed in the presence of the court which cause an obstruction to its proceedings in the administration of the law, may be and frequently are punished by the immediate committal of the offender to prison or by fining him. The power of enforcing their process and of vindicating their authority against open obstruction or defiance is incident to all duly-established courts of justice.

Conti, LOUISE MARGUERITE OF LORRAINE, PRINCESS OF, was the daughter of Henry, Duke of Guise, and by her beauty and wit attracted the admiration of Henry IV., who would have married her. She allied herself, however, in 1605 to Francis, Prince of Conti, and on his death in 1614 married Marshal Bassompierre, whose disgrace she shared, dying in 1631. She left a diverting *History of the Amours of Alexander the Great*, the king being designated by this transparent pseudonym.

Conti, PRINCE OF, a title borne by the younger branch of the house of Bourbon-Condé since 1551, when the seigneurie of Conti or Conty, near Amiens, passed into possession of the family. ARMAND, Prince of Conti, was born in Paris in 1629, being the younger brother of the great Condé, with whom he was imprisoned for a time owing to participation in the intrigues of the Fronde. Mazarin subsequently released him, and gave him his niece as well as the governorship of Guienne and Catalonia. He was the author of several works on manners and morals, dying in 1666. FRANCIS LOUIS, son of the preceding, was a distinguished soldier, and fought at Fleurus and Neerwinden. At the death of Sobieski (1697) he was elected king of Poland, but was ousted by Augustus II. He died in 1709. The last member of the family died at Barcelona in 1814.

Continent, in *Geography*, is a term of somewhat vague import, but defined as being a tract of land nowhere entirely divided by the sea. Formerly geographers reckoned four continents—Europe, Asia (which really form one), Africa, and America. To these have been since added Australia and the supposed continent of the Southern Polar regions. The English use the word in a special and restricted sense to denote the rest of Europe.

Continental System, a principle of isolation which Napoleon endeavoured in 1806 to establish by a paper blockade to prevent other European nations from having commercial intercourse with England. This Berlin decree was met by the English Government issuing, in 1807, an order in council which inaugurated a system of reprisals. This was further met by Napoleon with the Milan decree of 1808 of a still more stringent nature. Both decrees and orders set utterly at naught the international rights of neutrals, who were the chief sufferers. Russia's refusal to accede to Napoleon's views led to the disastrous Moscow campaign. The principle of paper blockade has now been generally abandoned.

Contingent Remainder. [REMAINDER.]

Contour-lines on a map or plan are lines of

constant level. If one were to travel along a contour-line, the route followed would be horizontal. Contour-lines are very important for maps of hilly districts. Paths of quickest descent are at right angles to the contour-lines and are exemplified by the courses followed by streams of water.

Contraband, in international law, such goods as are prohibited to be imported or exported, bought or sold, either by the laws of a particular state or by special treaties; also a term applied to designate that class of commodities which neutrals are not allowed to carry during war to a belligerent power. It is a recognised general principle of the law of nations that ships may sail to and trade with all kingdoms, countries, and states in peace with the countries whose flags they bear, and that they are not to be molested by the ships of any other power at war with the country with which they are trading unless they engage in the conveyance of contraband goods. The question whether certain goods (other than munitions of war as to which there is no question) are or are not contraband is often a very difficult one. Generally speaking, it depends partly on the practice of each nation and partly on stipulations in treaties.

Contract, an agreement between competent persons upon a legal consideration to do or to abstain from doing some act. The term is usually employed to designate only simple or parol obligations, which comprehend not only verbal and unwritten contracts, but all contracts not of record or under seal. Contracts are divided into three classes. 1. *Contracts of record*, such as judgments, recognisances, and statutes staple. 2. *Specialities* which are under seal, such as deeds and bonds. 3. *Simple contracts*, or contracts of parol. Every contract is founded upon the mutual agreement of the parties. When the agreement is formal, and stated either verbally or in writing, it is called an express contract; when the agreement is matter of inference and deduction, it is called an implied contract. In its widest sense agreement is not a technical term, and all agreements are not legal agreements. People may agree about many things without intending thereby to create any legal obligation; for instance, persons may agree to take a journey together, or to form a party of pleasure. Those agreements which are intended to produce legal obligations, and are adapted to produce such obligations, are contracts. All contracts are agreements, but all agreements are not contracts. A contract always effects a legal obligation either on one side or on both, but obligations may arise in other ways than by contract. [CONSIDERATION.]

Contractile Vacuole, the structure in the PROTOZOA which is supposed to act as the excretory organ. In *Amœba* (q.v.), for example, there is near the centre of the protoplasmic mass of which it consists, a clear round body which appears to alternately expand and contract; this is the contractile vacuole. In *Amœba* it appears to be simply due to the gradual growth of a single drop of fluid; in other forms, as in the "Slipper Animalcule" (*Paramecium*), it is formed by the union of several

droplets; these commence at first as mere lines radially arranged around a minute central cavity; the lines expand into pear-shaped bodies; these fuse at their thicker inner ends to a central vacuole; this continues to grow, the radial lines disappear, and the whole vacuole finally bursts; its contents are thus discharged. The function of the contractile vacuole is thus the expulsion of superfluous water; the soluble excretory products are doubtless dissolved in this water, while other insoluble in-nutritious particles have been observed to collect in the vacuole and are thus also got rid of. In some Protozoa, such as the "Bell Animalcule" (*Vorticella*), there is a special "vacuolar duct," into which the contractile vacuoles discharge.

Conulariidae, an extinct family of Pteropoda (sea butterflies) occurring in the Cambrian and Silurian systems. They were provided with shells, and attained much larger dimensions than any living representatives of the class. The reference of these fossils to the Pteropods is, however, not free from doubt.

Convection, in *Physics*, a process of altering the distribution of heat in a system by actual conveyance. A body may impart some of its heat to another by giving heat to the air particles in its immediate neighbourhood, these particles then carrying the heat to the other; such a process is termed convection, and is of much importance in nature. By convection the upper layers of water in a kettle that is being heated from below are themselves heated. Similarly an electrical body may lose its electricity by touching and electrifying neighbouring particles of air, which then carry off the electricity elsewhere. This process is observable in the Brush discharge (q.v.).

Convent is an ecclesiastical word used to denote a community of religious persons of either sex, who unite together to carry on a common life in obedience to a fixed constitution and in observance of a fixed discipline. Among Protestants the word is often restricted to a community of nuns, the word monastery being used to denote a community of men; but there is no such real distinction.

Convention sometimes signifies an agreement, whence our use of the adjective conventional to denote what is in accordance with the tacit principles governing society. In a political sense the word is used to denote an informal parliament, which assumes power during an interregnum, and whose measures require the later sanction of a properly formed parliament in order to have legal force. Such a convention arranged the return of Charles II., and such another bestowed the British Crown upon William of Orange. In the United States, "State Conventions" are the assemblies occasionally elected to revise the State Constitutions, while party conventions meet for various purposes, especially to settle the nomination for the presidency.

Conversano, a town in the province of Terra di Bari, Italy, 20 miles S.E. of Bari. It is the seat of a bishopric, and possesses a cathedral, castle, foundling asylum, hospital, and several convents

Wine, oil, almonds, and cotton are produced in the neighbourhood.

Conveyance, Conveyancing. A conveyance is a deed or document by which property is conveyed from one person to another, whether by grant, assignment, appointment, lease, settlement, or otherwise. Conveyances of real property operate either according to the rules of common law or under the "Statute of Uses." The most important statute as regulating the present system of conveyancing is the "Conveyancing and Law of Property Act, 1881" (44 and 45 Vict. c. 41), the principal object of which was to shorten deeds by several enactments, which prescribe that certain general words, covenants, and conditions theretofore used by conveyancers in the preparation of deeds should be implied by virtue of the Act, *unless* the parties stipulate to the contrary. Short forms of statutory mortgage transfer and reconveyance are scheduled in this Act, also short forms of mortgage, further charge, conveyance on sale, and marriage settlement. The "Solicitors' Remuneration Act" of the same year brings into use an entirely novel mode of remunerating solicitors for conveyancing business, the same being by way of commission upon the amount of purchase-money or rent, etc. Both Acts were originally introduced by Lord Cairns. The former Act also contains important provisions against forfeitures of leases, the powers and duties of mortgagors, mortgagees, trustees, and executors, the management of the property of married women and infants, and the recovery and redemption of rent-charges, and it sanctions the residue of long terms, *i.e.* a residue of not less than 200 years of a term originally created for not less than 300 years, to be converted into a fee simple.

Convocation was formerly the name of a provincial ecclesiastical synod. In England the word denotes an assemblage of prelates and inferior clergy, who are summoned by the authority of the Crown, and have no legislative power as a certain number of the consciences of churchmen. The convocations of York and London, each of the provinces, are presided over by the archbishop of the province respectively. They sit in two houses; the upper house formerly of mitred abbots, and the lower of elected representatives of the secular clergy, and these houses deliberate separately, but their decisions are similar. Convocations do not sit in separate chambers, but are summoned and meet in the same hall as the House of Commons. In 1717 the convocation of York was dissolved, and the convocation of London was dissolved in 1851. The convocation of York was re-established in 1851, and the convocation of London was re-established in 1851. The convocation of York is generally summoned by the archbishop of York, and the convocation of London is generally summoned by the archbishop of Canterbury (q.v.). The convocation of York is generally summoned by the archbishop of York, and the convocation of London is generally summoned by the archbishop of Canterbury (q.v.). The convocation of York is generally summoned by the archbishop of York, and the convocation of London is generally summoned by the archbishop of Canterbury (q.v.).

Conway, or ABERCONWAY, a port in Carnarvonshire, N. Wales, on the W. bank of the estuary of the river Conway, 12 miles S.E. of Bangor. It is an ancient Celtic settlement, and was fortified by Edward I. (1284), whose massive castle still stands

They have scattered, exstipulate leaves; no bracts below the calyx; a conspicuous funnel, belt, or trumpet-shaped corolla of five united petals; five stamens and a two-chambered ovary containing four seeds. With the pink and white-flowered *Convolvulus arvensis*, a pretty cornfield weed, are commonly united the forms with two large bracts below the calyx, sometimes known as *Calystegia*, including the large white *C. sepium* and the pink sea-side *C. Soldanella*, both British. *C. tricolor*, a native of the Mediterranean region, with blue flowers with a white and yellow centre, is commonly known in gardens as "Minor Convolvulus." The root of *C. Scammonia* yields the purgative drug scammony.

Convoy, the name applied sometimes to ships of war which are employed in war time to escort merchant ships from port to port, and sometimes to the merchant vessels so escorted. While the duty of the warships is to protect their charge, the duty of the latter is to use their best endeavour not to part from the escort. If it can be proved that such parting is owing to wilfulness or neglect, no claim for insurance on account of damage which may have happened in consequence will hold good.

Convulsionnaires, a sect which sprang up among the Jansenists in France in 1730, and which centred itself around the memory of one Francis of Paris, at whose tomb miracles were alleged to take place. The sect was the victim of one of those apparently hysterical seizures which have inexplicably cropped up from time to time in Church history, whence their name. Voltaire said that the grave of Francis of Paris was also that of Jansenism.

Convulsions, a term applied to violent involuntary contractions of groups of muscles. In tonic convulsions one set of muscles is affected by contraction for a sensible period, while in clonic convulsions groups of muscles of more or less opposite action are alternately involved by spasmodic contraction, producing, for example, flexion and extension of parts of the limbs in rapid succession to one another. The convulsions of epilepsy and of uræmia will be treated of under these heads. [CHOREA, HYSTERIA.] Convulsions may result from organic disease of the brain, and may be associated with the puerperal state. *Infantile convulsions.* Children are peculiarly liable to convulsive seizures, the onset of acute disease, for example, which is so often attended by a rigor or shivering fit in an adult, may in a child be accompanied by convulsions. Again, during teething and in association with rickets they may occur. In the treatment of "fits" in children it is usual to adopt certain remedies, the most popular of which is the warm bath; it must of course be borne in mind, however, that the fit is, as a rule, merely a symptom of some disease, and the chief point is to make out in the first instance what that disease is.

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on a rock commanding the river, and is connected with the old walls, a mile in circumference, that surround the town. Among other buildings of the Elizabethan period the town contains Plas Mawr, a fine house belonging to the Mostyn family. Telford's suspension bridge (1826) and Stephenson's tubular bridge (1848) are interesting specimens of engineering skill. The trade is inconsiderable, and the prosperity of the place depends chiefly on its attractions as a resort for holiday-makers. Conway was formerly one of the Carnarvon parliamentary boroughs, but in 1885 was thrown into the Carnarvon district. Pop. (1901) 6,368.

Conway, HENRY SEYMOUR, Field-Marshal, the second son of the first Lord Conway, was born in 1720, and adopted the military profession. He was aide-de-camp to the Duke of Cumberland at Culloden, and as lieutenant-general served with distinction under Prince Ferdinand of Brunswick in 1761. He next entered Parliament, and was Secretary of State from 1765 to 1768. He then returned to the army, of which he became commander-in-chief in 1782, when he proposed in Parliament the abandonment of the American war. Though able, courageous, and cultivated (Horace Walpole was his close friend, and he wrote a play), he lacked the vigour necessary to achieve greatness. He died in 1795.

Conway, HUGH, the *nom-de-plume* under which Frederick Fergus won considerable popularity as a writer of sensational romances. Born in 1840, and brought up to business at Bristol, Fergus wrote in 1883, for *Arrowsmith's Annual*, a highly melodramatic story entitled *Called Back*. The success of this clever but by no means elevated specimen of fiction was extraordinary. Next year the author produced *Dark Days*, a far less striking performance. In 1885, whilst *A Family Affair*, which showed signs of higher artistic capacity, was appearing in the *English Illustrated Magazine*, Mr. Fergus was seized with typhoid fever and died at Monte Carlo. A few posthumous sketches of moderate merit have appeared since his death.

Conway River takes its rise from Lake Conway on the borders of the counties of Merioneth, Denbigh, and Carnarvon. Flowing first N.E., then N.W. and N., it divides the two latter counties, drains the picturesque Vale of Conway, and after a course of 30 miles discharges its waters into Beaumaris Bay. It is navigable for vessels of 100 tons for a distance of 10 miles from its mouth.

Cony, Coney, a Middle English name for the rabbit (q.v.). The word occurs in the Authorised and Revised Versions of the Bible, where it translates the Heb. *shaphan*, probably the Syrian species of Hyrax (q.v.).

Conybeare, THE VERY REV. WILLIAM DANIEL, F.R.S., was born in 1787, and educated at Westminster and Christ Church, Oxford, where he took high honours. He devoted himself to the study of geology, just at that moment coming into prominence as a science. With Dr. Buckland he made a survey of the north of Ireland. In 1821 he constructed the skeleton of the Plesiosaurus, and in

1822 brought out, in conjunction with Phillips, the *Outlines of the Geology of England and Wales*. He held for many years the rectory of Sully, Glamorgan-shire, delivered the Bampton Lectures in 1839, and in 1847 was appointed Dean of Llandaff. He died in 1857.

Conybeare, THE REV. WILLIAM JOHN, son of the preceding, was born about 1815, and was educated at Trinity College, Cambridge, where he obtained a fellowship. He was appointed principal of the Liverpool Collegiate Institution, and in conjunction with the Rev. J. S. Howson wrote *The Life and Epistles of St. Paul*, a work that has been received with much favour. He was the author of a remarkable *Essay on Church Parties* in the *Edinburgh Review*, of a novel entitled *Perversion*, and various essays and sermons. He died in 1857.

Cook, DUTTON, the son of a London solicitor, was born in 1832, and educated for his father's profession. His bent, however, was towards literature, and after some success as a novelist, his chief productions being *Paul Foster's Daughter* (1861), *Hobson's Choice* (1866), and *Over Head and Ears* (1868), he was appointed assistant editor of the *Cornhill Magazine*. He next turned his attention to dramatic criticism, and worked on the staff of the *Pall Mall Gazette* until 1875, subsequently joining the *World* as a writer on dramatic and artistic topics. Besides contributing to many periodicals, he brought out in his later years two successful stories, *The Trials of the Tredgolds* and *Doubleday's Children*. He died in 1883.

Cook, ELIZA, was born in Southwark in 1818, being the daughter of a well-to-do merchant. She began to write in her childhood, and at an early age contributed tales, verses, and articles to *The New Monthly Magazine* and other periodicals. In 1838 she published a volume of poems under the title of *Melaia and Other Poems*. A second volume appeared in 1864, and a third, called *Diamond Dust*, in 1865. From 1849 to 1854 she edited *Eliza Cook's Journal*, but gave it up owing to failing health. Her style is simple, not to say common-place, but it attracted the uncritical public, with whom her songs such as "The Old Arm Chair" and "Home in the Heart" were great favourites. She died in 1889, having for five-and-twenty years enjoyed a pension of £100 on the Civil List.

Cook, JAMES, a distinguished navigator, was born of humble parentage at Marton, Yorkshire, in 1728, and at the age of 13 was bound apprentice to a small shopkeeper. A year and a half later he obtained his discharge, and went to sea in a collier as a foremast man. In 1755, being then a master, he volunteered to serve in the navy, and joined the *Eagle*, 60, Captain Joseph Hamer. He was promoted to be master in 1759, and served in the *Mercury* with the expedition against Quebec. Here he first gave proof of his great abilities, and was employed in surveying the St. Lawrence. He afterwards surveyed the coasts of Newfoundland. In 1768, a commander being required for a vessel which was to be sent to observe a transit of Venus in 1769, Cook was given a commission as lieutenant

and appointed to command the *Endeavour*, which he navigated *via* Rio Janeiro to Otaheite (where the transit was observed), New Zealand, and home by Batavia and the Cape of Good Hope. This obtained him in 1771 promotion to the rank of Commander. In 1772 he was given command of a new expedition consisting of two small vessels, the *Resolution* and *Adventure*, and he proceeded again to the South Seas, where he made many discoveries, and whence he returned in 1775. For this service he was made a post-captain, and appointed Captain of Greenwich Hospital; and in 1776 he was made a Fellow of the Royal Society. In the meantime Cook had sailed on his last expedition. After demonstrating the impracticability of a northern passage between the Pacific and the Atlantic, and making many fresh discoveries in the Pacific, he lost his life on Feb. 14, 1779, at Owyhee in the Sandwich Islands during a fray with the natives.

Cook, DR. FREDERICK A., Arctic explorer, was born in the United States in 1865. He was surgeon of the Peary Arctic expedition (1891-2), and of the Belgian Antarctic expedition (1897-9). In 1909 he returned from a polar exploration in which he claimed to have reached the North Pole. He is author of *Through The First Antarctic Night*, and various papers on polar exploration.

Cook, MOUNT, or RORANGI, the culminating point of the Southern Alps, in the province of Canterbury, South Island, New Zealand. It has an elevation of nearly 12,460 feet, and its summit is clothed with perpetual snow.

Cook, RICHARD, R.A., was born in London in 1784, and, after a course of training in the Academy schools, began to exhibit in 1808, dealing chiefly with scriptural subjects. In 1816 he was chosen Associate and in 1822 Royal Academician, after which date he exhibited no more, being a man of private means. Besides illustrating Scott's *Lady of the Lake* and *Rob Roy*, he is only known to have painted two important pictures. He died in 1857.

Cooke, SIR, was born about 1506, and, having acquired a high reputation for morality, was appointed tutor to Edward VI. He was converted to his Protestantism, and gave up his voluntary exile, from which he returned in 1576.

Cooke, BENJAMIN, was born in 1739, received the degree of Doctor of Divinity in 1762, and was elected Bishop of London in 1769. He was a member of the Academy of Arts, and a Fellow of the Royal Society. He was a member of the Church of England, and a member of the Society of Friends. He died in 1791.

Cook, GEORGE, was born in Westminster in 1701, and was a printer, but

took to the stage. He made his first appearance in London at the Haymarket theatre in 1778, but met with little appreciation. He then made himself a considerable name in the provinces and especially in Dublin. In 1800 he once more appealed to the London public in *Richard III.*, and was received with enthusiasm. For ten years he was regarded as second only to John Kemble. He was induced to go to America in 1810, and died there in 1811, his irregular habits having broken his magnificent constitution. Edmund Kean caused a monument to be erected on his grave.

Cooke, THOMAS POTTER (T. P.), the son of a surgeon in London, was born in 1786. Losing his father early, he went to sea and served in the Mediterranean until the Peace of Amiens. In 1804 he appeared on the stage of the Royalty theatre, and soon became a popular melodramatic actor. One of his most popular impersonations was William in *Black-eyed Susan* (1829), and he was greatly applauded as Long Tom Coffin in *The Pilot*, when he danced his famous hornpipe. For many years he was in high favour at Astley's and the Surrey, dying in 1864.

Cookery. It has been said that cookery is the most ancient of the arts, and that it has rendered more important services to society than any other art, because it was in the preparation of food that man learned to use fire, and it is through using fire that he has subdued nature. Even those who consider these claims on behalf of cookery to be extravagant must acknowledge that until the use of fire was discovered the knowledge of cookery was unknown, for cookery is neither more nor less than the application of heat to food, to make it more palatable and more digestible. The appreciation of cookery has varied in different ages and different countries according to the degree of culture possessed by the people of those countries. Amongst the ancient Greeks it was highly esteemed. Poetry and music were associated with the pleasures of the table, and we read in Homer that Achilles and Patroclus took part in cooking the food for a banquet given in honour of royal guests. From ancient books also we learn that Cadmus, who introduced into Greece the Phœnician characters from which the Greek alphabet was derived, had been cook to the King of Sidon. The Romans were less refined in their ideas of cookery than the Greeks; they believed in abundance of luxury more than in delicacy of flavour, and were proud of the costliness of their viands, while occasionally their luxury assumed grotesque forms. Thus we read of banquets where dishes were served whose sole merit was their cost, as the dish composed of the brains of 500 ostriches, or that in which were seen the tongues of 5,000 singing birds. The ancient Britons, on the other hand, knew little of cookery. They lived chiefly on coarsely bruised barley mixed with milk.

Amongst modern nations the French are the most celebrated for their skill in cookery. Until quite recently all but the very wealthy amongst the English were notoriously ignorant of the art.

Of late years, however, more attention has been bestowed on it, and vigorous efforts have been made by persons interested in the public welfare to make the general public realise the importance of the subject. This is a cause for congratulation, for, as Count Rumford said, "Cookery and agriculture are arts of civilised nations, savages understand neither of them." Cookery certainly deserves to be studied with the greatest care. The number of inhabitants which may be supported in any country upon its internal produce depends as much upon the state of the art of cookery as upon that of agriculture.

There are six different ways of cooking food, and they are termed processes of cookery:—(1) Broiling, (2) roasting, (3) boiling, (4) stewing, (5) frying, and (6) baking. Of these *Broiling* is the most ancient, the most simple, and the most nutritious, because when well done the natural juices of the meat are best retained by it. *Roasting* may be described as most wholesome, and when not understood thoroughly the most difficult to accomplish. A great cook, Brillat Savarin, used to say, "Cookery is an art, but to roast requires genius." Curiously enough, English cooks who fail with all other modes of cookery are often skilled in roasting. *Boiling* is the easiest mode of cookery, and it is most often badly done. *Stewing* is the best process for digestion, and it consists in cooking the food at the lowest temperature possible. *Hashing* is the same process applied to meat already cooked. Food thus prepared is less nourishing and less wholesome than food freshly cooked. *Frying* is the most speedy mode of cookery, and food cooked thus is very tasty. There are two ways of frying, the wet method, when the article to be cooked is immersed in very hot fat; the dry method, when it is tossed over the fire with very little fat. *Baking* is the most convenient mode of cookery. It is very similar to roasting, the difference between the two being that in roasting the food hangs in the open before a bright fire, in baking it remains motionless in a confined space. Consequently, the volatile fatty acids which are generated do not escape. It may be roughly calculated that animal food loses one-fourth of its weight by being cooked.

Cook's Islands, or THE HERVEY ARCHIPELAGO, lie in the Pacific Ocean (lat. 18° to 22° S., long. 158° to 162° W.), S.W. of the Society Islands. Their total area is 300 square miles, and the chief members of the group are Mangeia, Raratonga, Aitutake, and Auotu. Discovered by Captain Cook in 1777, they became in 1823 the scene of the missionary labours of John Williams; many of the natives are now Christians. Though water is scarce, vegetation is luxuriant, bread-fruit, coconuts, and plantains being the chief products. The inhabitants are chiefly Malays, and their industry and mechanical skill raise them above the level of most of the Polynesian races.

Cookstown, a market town on the river Ballinderry in the N.E. of co. Tyrone, Ireland. It is 158 miles from Dublin by railway, and 53 miles W. of Belfast. Linen is the staple manufacture, and there are large bleaching works, with flax and corn mills. Killymoon Castle is near the town.

Cook Strait, the channel that divides North from South Island, New Zealand, was discovered by Captain Cook in 1770 and named after him.

Coolies, from a Hindoo word meaning labourers, is applied generally to Eastern labourers, who are carried to different colonies and countries whose climate is unfitted to European labour, and where native labour is not to be obtained. The coolies are in the majority of cases Chinese, and their employment has given rise to such a rush of Chinese immigrants to various parts as to make their admission to a country one of the most important international and ethnical questions of the day. Many coolies have also been brought from the South Sea Islands under contracts which bind them to a certain number of years' service at a certain rate of pay. Till governments began to look into things, there was much abuse of this coolie-supplying system, and the "blackbirding" of the South Sea Islands was hard to distinguish from the old slave-trade.

Coomassie, or KUMASSI, the capital of Ashanti (q.v.), West Africa, stands on a low rocky eminence, surrounded by a dense jungle and pestilential swamps, about 130 miles N.N.W. of Cape Coast Castle. It was founded by Sy Tutu in the middle of the eighteenth century, and is about 3½ miles in circumference, with broad, regular streets and stuccoed houses painted red and white. The British, under Wolseley, captured the place in 1874 and destroyed the palace, close to which is the grove where many human victims were annually slaughtered. A considerable trade is carried on with the interior, and the wealthier inhabitants use gold freely for ornamental purposes. In 1900 a rising again took place against the British, and Coomassie was invested. It was, however, relieved after some months, and the rising was quelled.

Cooper, SIR ASTLEY PASTON, BART., was born at Brooke, Norfolk, in 1768, and after studying surgery under Clive and John Hunter, became demonstrator of anatomy at St. Thomas's Hospital (1787), professor at Surgeon's Hall (1792), surgeon to Guy's Hospital (1800), and professor of comparative anatomy at the College of Surgeons (1813). His skill as an operator, and his scientific knowledge, placed him at the head of his profession. In 1820 he treated George IV. with success and received a baronetcy, which descended to his nephew, as he had no children. He was elected president of the College of Surgeons in 1827, and was honoured with many other distinctions. His few published works deal with professional subjects. He died in 1841.

Cooper, JAMES FENIMORE, the son of a judge in New York, U.S.A., was born at Burlington, New Jersey, in 1789. Having been educated at Yale College he entered the U.S.A. navy, but retired and married in 1811. He published anonymously in 1819 *Precaution*, a fashionable novel, which was hardly a success. In 1821 appeared *The Spy*, a far more popular effort, and this was followed by *The Pioneers*, *The Pilot*, and *The Last of the Mohicans*. His fame was becoming widespread, when in 1822

he passed over to Europe, and produced *The Prairie* and *The Red Rover*, two of his most vigorous works, with others that hardly enhanced his reputation. Whilst living in Paris he was drawn into a controversy as to the political constitution of the United States, and after writing numberless letters in the Press, he wrote three novels—*The Bravo* (1831), *The Heidenmauer* (1832), and *The Headsman of Berne* (1833), with the avowed intention of decrying aristocratic institutions. Returning to America he carried his polemics with him, and for some years was engaged in acrimonious disputes, in which his vanity and bad temper were more conspicuous than his talent. To this period belong *Monikins*, *The American Democrat*, *England*, *Homeward Bound*, and *Home as Found*. The severe handling which he received from the critics provoked him to bring a series of actions for libel, and in these he came off with flying colours. He then recovered public favour by reverting to his early style in *The Pathfinder* (1840), *The Deer Slayer* (1841), *The Two Admirals* (1842), *Wyandotté* (1843), *Afloat and Ashore*, and *Miles Wallingford* (1844). From his facile pen, however, came several more solid compositions, such as *A Naval History of the United States*, and *Lives of Distinguished American Naval Officers*, with several books recording his European experiences. He resumed his controversial tone in *The Littlepage Stories* (1845-6). *Oak Openings*, *Jack Tier*, *The Sea Lions*, and *The Ways of the Hour*, occupied the closing years of his life. He died in 1851 at Cooperstown, a village founded by his father on Lake Otsego.

Cooper, THOMAS, poet and journalist, was born in 1805 at Leicester, and brought up at Gainsborough. At 15 he was apprenticed to a shoemaker, but devoted every spare moment to study. In 1829 he became a schoolmaster, and afterwards a provincial journalist. He was converted to Chartism, and was condemned to two years' imprisonment for sedition and conspiracy in connection with the Potteries' riots. In prison he wrote *Prison Sketches* and *Prison of Suicides*. For a time a Methodist, he eventually rejected Christianity, and afterwarde published *Christian Evidences*. He died in 1890.

Cooper, THOMAS, was born at Canterbury in 1823. From 1823 to 1827 he was a student at the drawing-school of the Royal Academy, where he worked his way up to the position of an appreciated and successful artist. He was exhibiting from 1833, secured the Vernon prize at the Royal Academy, and was a combination of the most successful and the most successful in the world. He died in 1890.

1867. He gave to the world in 1890 an interesting history of his own career. He died in 1902.

Cooperage (from Dutch *koop*, to buy), a system of barter carried on upon the high seas, principally by Dutch and Belgian vessels, which patrolled the North Sea and provided the North Sea fishers with goods, especially spirits and tobacco, in return for money, gear, or fish. So much evil in the shape of drunkenness, waste of stores, and disposal of fish resulted from this practice, that a determined set was made against it by deep-sea missionaries and smack owners, and at an international conference at The Hague a convention was signed in 1887 to prohibit the traffic in spirits on the North Sea. Trading vessels are subject to heavy fines for offences against the convention.

Cooper's Hill, a sandy elevation rising 142 feet above the Thames on its S. bank, and close to the Berkshire border of the county of Surrey. It commands a fine view over the Thames valley. There since 1870 has been established the Government Civil Engineering College, destined originally to train young men for the public service in India, but now thrown open to all who desire a professional education. The spot was immortalised by Pope and Denham.

Coordinates, in *Mathematics*, are measurements that fix the position of a point, line, area, or volume. Thus, the position of a point on this sheet is determined if we know its distances from the top edge and from the left-hand-side edge. So, also, a point in a room is found when we know its distances from the floor and from two walls that meet each other. The discussion of the properties of figures by investigating the coordinates of their constituent points belongs to *Coordinate Geometry*.

Coorg, formerly an independent principality on the E. side of the Western Ghâts in Southern India. Since 1834 it has been a province of British India. It is very mountainous, having a mean elevation of 3,000 feet, and is drained by the Cauvery and its tributaries, which are frequently rendered torrents by the heavy rainfall amounting annually to 160 inches. Owing to humidity, dense jungles and bamboo forests cover much of the area, but recently these have been cleared away, to the improvement of the climate, which is not unhealthy. The inhabitants are a fine race of agriculturists. The Kodagas are the chief tribe. Being of Dravidian origin they speak a Canarese dialect, retaining their primitive devil-worship and several peculiar customs, such as the community of wives between the brothers of a family. Throughout the district are great artificial ramparts (Kunnidegs) of unknown origin. Coorg preserved its independence from 1583, or earlier, to 1773, when Hyder Ali seized on the country and imprisoned the young rajah, who, however, escaped and joined the English in breaking Tippoo's power. But alleging the misrule of a later sovereign as a pretext, Lord William Bentinck dispatched General Fraser in 1834 to annex the country. The area of the province is about 1,600 square miles. The exports are rice, coffee, and cardamoms, coarse blankets being the only manufacture.

Coot, any bird of the aquatic genus *Fulica* of the Rail family. There are ten species, world-wide in distribution, and distinguished by a lobed membrane on the toes, and a large frontal shield. The common coot (*F. atra*) is a native of England, frequenting marshes, lakes, and gulfs, but visits Scotland only in the summer. It is also common over the European continent. The length is about 16 inches, general plumage slaty-black, bill, frontal shield, and narrow band on the wings white. The flesh is little esteemed for the table. Coots make a large nest of water-plants, and lay from seven to ten eggs, which are brownish-white with dark brown spots.

Coote, GENERAL SIR EYRE, K.C.B., the son of an Irish clergyman, was born near Limerick in 1726, and entering the army early served against the Pretender in 1745. In 1754 he joined Clive in India, was promoted to the rank of colonel for his services at Plassy, and in 1760 was sent to the Carnatic, where he defeated Lally at Wandewash. He returned to England, received the thanks of Parliament and a diamond-hilted sword from the directors of the Company, and in 1769 was raised to the chief command in Madras. Quarrelling with the governor, he again came home and for several years held the governorship of Fort St. George. He went out once more in 1780 as commander-in-chief under Warren Hastings, and next year defeated Hyder Ali at Porto Novo. He then paid a visit to Calcutta, and was on his way back to Madras when his ship was chased by a Frenchman. The indignation at this misadventure brought on apoplexy, of which he died in 1783.

Copaiba, or COPAIVA BALSAM, a pale yellow, unpleasantly aromatic, bitter oleo-resin which exudes copiously from incisions in the stems of the Brazilian leguminous trees *Copaifera Lansdorffii*, *C. officinalis*, *C. Martii*, and *C. guianensis*. It is shipped from Para, Maracaibo, and Bahia, our imports reaching about 500 cwt. annually. It is used in making printer's ink, and in medicine as a stimulant, cathartic, and diuretic.

Copal, a resinous substance which occurs as an exudation from certain trees in the East Indies, S. America, and other tropical regions. It hardens by exposure to air, and comes into commerce as smooth, yellowish, translucent lumps. Its solution in turpentine, or other volatile solvent, is largely used as a transparent and almost colourless varnish.

Coparceners, Coparcenary. An estate held in coparcenary is where lands of inheritance descend from the ancestor to two or more persons. It arises either by Common Law or by particular custom. (1) By *Common Law*, as where a person seised in fee simple or in fee tail dies and his next heirs are two or more females—his daughters, sisters, aunts, female cousins, or their representatives—in this case they all inherit, and these coheirs are termed coparceners or, for brevity, parceners only, though in some points of view the law treats them as making together only one heir. (2) Parceners by *particular custom* are where

lands descend, as in gavelkind, to all the males in equal degree as sons, brothers, uncles, etc. [COMMON LAW, GAVELKIND.]

Cope (Lat. *cappa*), a large outer cloak, at first an article of ordinary attire, but later adopted and retained as an ecclesiastical vestment worn by a priest or higher dignitary in processions and at solemn services other than the mass. But in the English Church its use by the celebrant at the eucharist was prescribed by the 24th Canon of 1603 in cathedrals and collegiate churches. The practice of wearing it prevailed till the end of the eighteenth century, and in accordance with recent decisions of the ecclesiastical courts its use has been revived, not without some heartburnings and warm expressions of feeling. The cope is semi-circular in shape, the curved side forming the bottom and the neck of the wearer coming at the centre of the diameter. A clasp or other joining called a *morse* is sometimes employed to secure the cope. The material is often silk, and its embroidery and ornamentation have given scope for some of the most valuable examples of ecclesiastical art. The colour of the vestment varies with the season or with the occasion of its wearing. From the substantive is derived a verb meaning to cover as with a cope, and used chiefly in architecture as "coping," "coping-stone." Another verb, "to cope," is connected with the Dutch *koop*, trade, and signifies *to bargain*, whence the expression *horse-coper*, and the phrase *to cope with* in the sense of to oppose successfully, to be a match for.

Cope, CHARLES WEST, born 1811 at Leeds, received his education as a painter at the Royal Academy, and in Italy and the Netherlands. At the age of twenty he began to exhibit pictures illustrative of history or of dramatic scenes. He was elected A.R.A. in 1844, and at the same time received a commission to execute the eight frescoes that adorn the Peers' corridor at Westminster. The full distinction of R.A. followed in 1848. From 1867 to 1874 he was professor of painting in the Royal Academy. He died in 1890. As his artistic career covers a period of over half a century, his works are very numerous. Among the later ones may be mentioned *Launcelot Gobbo's Siesta*, *The Taming of the Shrew*, *The Good Shepherd Giveth His Life for the Sheep*, and *Anne Page and Slender* (1882). In colouring and style he approaches Mulready, displaying less brilliancy but more correctness.

Cope, GENERAL SIR JOHN, K.C.B., appears to have entered the army in 1707 and to have been colonel of the 7th Foot. He was in command of the king's forces in Scotland when the rebellion of 1745 broke out, and fell back before the Pretender as far as Preston Pans near Edinburgh. Here he trusted to a marsh to protect his front, and was consequently surprised and defeated. Though acquitted by a council of inquiry, he was much blamed for this disaster, but was afterwards employed in Ireland. He died in 1760, and his fame is preserved in the popular Scottish song, "Johnnie Cope."

1. Color - Black (S.V.) belonging to black (S.V.). The black (S.V.) is distinguished from black (S.V.) by the fact that they are black (S.V.) and have four or

Copernicus, NICOLAS (1473-1543), the inaugurator of the modern system of astronomy, was born at Thorn in Poland, now West Prussia. His father was Polish and his mother German. Educated under the auspices of his uncle, Lucas, prince-bishop of Ermland, he matriculated at Cracow University in 1491, and studied mathematics, optics, and perspective. In 1496 he became a student of the canon law at Bologna, and in 1497 was nominated to a canonry at Frauenberg, Frisches Haff. In 1500 he was lecturing on astronomy at Rome, and observed there an eclipse of the moon. In 1501 he studied medicine at Padua, and, after taking his degree as doctor in canon law, he settled in Prussia in 1505. He never took full Orders, but from 1507-1512 he occupied the post of medical attendant upon his uncle. Upon his uncle's death he became possessor of £450 a year, and devoted himself chiefly to astronomy, his time, however, being also occupied by a variety of duties. In 1523 he was administrator of the diocese, and in 1542 he was smitten by the disease that carried him off the next year. It was in 1530 that his great work *De Orbium Revolutionibus* appeared. The great feature of this was the theory that the sun was the centre of our system, and that round it the earth, as well as the other planets, revolved. In the six books of this work he endeavoured to establish ten propositions, some of them fanciful, others true, but supported by fanciful arguments. But his main point was that the sun and not the earth was the centre of the solar system, and that the earth had a motion round its axis. He was not original in this view, since as early as the Pythagoreans a similar view had been entertained. His belief in circular orbits landed him in many difficulties, and rendered necessary the imagination of a system with checks and modifications to reconcile observed facts with

expected ones. It remained for Kepler to perfect the system. Strange to say, the views of Copernicus gave no offence to Catholics, but aroused bitter opposition among Protestants, Luther and Melancthon being among his opponents.

Coplant, JAMES (1791–1870), a Scottish physician, born at Deerness in the Orkneys. He took the degree of M.D. in Edinburgh in 1815, and in 1820 settled in London. Besides many papers in medical journals and elsewhere upon yellow fever, hydrophobia, cholera, and other medical subjects, he published in 1830 a *Dictionary of Practical Medicine*, and wrote upon palsy, apoplexy, and consumption.

Copley, JOHN SINGLETON, R.A. (1737–1815), noted as a portrait and historical painter, and also as being the father of Lord Chancellor Lyndhurst. Born at Boston, U.S., of English parents, who had emigrated from Ireland, he took lessons from his stepfather, who was a portrait painter and engraver, and showed such talent that at the age of 18 he was commissioned to paint Washington's portrait. In 1766–67 he sent works for exhibition in England, and in 1774 he set out for Europe, where he made the acquaintance of Reynolds and other painters, and was appointed to paint portraits of the king and queen. He then went to Italy for two years of study, and on his return painted the historical works upon which his fame chiefly rests. Of these perhaps the most notable are *The Death of Chatham* and *The Death of Major Pierson*, both in the National Gallery, and engraved by Bartolozzi and Heath respectively. Others of his works are *The Siege and Relief of Gibraltar*, *Surrender of Admiral de Windt*, *Charles I. Demanding the Surrender of the Five Members*, *The Signing of Strafford's Death Warrant*, and *The Assassination of Buckingham*.

Copper, a most useful and extensively distributed metal, which with its alloys has been employed in the arts even from pre-historic times. Though early weapons of pure copper have been found, its softness was a bar to its utility until the discovery of bronze, its alloy with tin, which gives its name to the Bronze age. The Greek *chalkōs*, and the Latin *aes*, apply apparently both to the metal and the alloy; but, from being obtained from Cyprus, the former acquired the name *cyprium*, corrupted into *cuprum*, whence its symbol in Chemistry is Cu. It is a bright metal of a peculiar red colour, having an atomic weight of 63.3, a specific gravity of 8.93, and a hardness between 2.5 and 3; very malleable and ductile, in tenacity second only to iron, in electric conductivity second to silver, and fusible at a red heat. Copper expands on solidifying from fusion. Like most of its compounds, it is partially volatile, imparting a brilliant green coloration to the flame. It dissolves in hydrochloric, sulphuric, and nitric acids, liberating hydrogen, sulphur-dioxide and nitric oxide respectively, the solutions turning blue on the addition of ammonia. Traces of copper occur in all soils, in some plants, and in the blood of animals. It forms nearly 6 per cent. of turacin, the red colouring-matter of the feathers of the turaco, or West

African plantain-eater; and as a mineral it occurs native and in a number of ores. Of these, the chief are the sulphides or pyrites, chalcopyrite, redruthite, erubescite, and tetrahedrite; the oxides, especially cuprite and the carbonates, malachite and azurite, which are separately described. Native copper crystallises in cubes and in octahedra, often twinned, or in extensive dendritic masses, or it is wiry or in other massive forms. In the extensive deposits south of Lake Superior, a mass of native copper 45 feet by 22 by 8, weighing over 400 tons, has been found, and large quantities also occur in Siberia and in South Australia, generally associated with copper-ores, from which it may have resulted by reduction. From its oxides or carbonates, copper is obtained by simply heating the ore with carbon and silica; but its separation from its commoner ores, the sulphides, is a more complex process of repeated roastings, ending with *poling*, or stirring with a piece of green wood to get rid of the last traces of oxide present. The alloys of copper are even more important than the pure metal. With zinc it forms *brass*, English brass containing about 70 per cent. of copper, and *Muntz's metal*, or *yellow sheathing*, from 50 to 60 per cent. With tin it forms *bronzes*, ordinary *bell-metal* containing 80 per cent. of copper, *speculum-metal* 65 per cent., and *phosphor-bronze* 85 to 95 of copper with about 2 per cent. of phosphorus, and the remainder tin. *Aluminium-bronzes* contain from 90 to 97½ per cent. copper and from 10 to 2½ per cent. aluminium. German, or nickel, silver contains about 63 per cent. of copper, with from 11 to 19 per cent. of nickel and the remainder zinc. These alloys are hard and brittle if cooled slowly; soft and malleable, if plunged when red-hot into cold water. The once important copper mines of Cornwall are now mostly exhausted, the production of copper from British mines having fallen from nearly 16,000 tons in 1860 to 3,600 in 1880, and to 666 in 1907. Swansea is the chief centre of an enormous copper-smelting industry, for which copper to the value of several millions sterling is annually imported, more than two-thirds of which is re-exported. Of this importation, half comes from Spain, a quarter from the United States, and a quarter from Chili.

Copperas, a name commonly given to *ferrous sulphate* or *green vitriol*, $\text{FeSO}_4 + 7\text{OH}_2$. It forms green crystals, which are soluble in water but soon oxidise. It is used among other purposes in calico printing, dyeing, and the manufacture of ink.

Copper-bottomed, or **COPPERED**. A vessel is said to be coppered when her bottom is sheathed with thin sheets of copper to protect it, if of wood, from the ravages of worms and the accumulation of vegetation, and, if of iron or steel, from corrosion. In iron or steel vessels, in order to preclude galvanic action, wood is interposed between the fabric and the copper; and even in wooden vessels, for the same reason, all the bolts and fastenings of the hull beneath the water-line should be of copper and not of iron. Vessels thus built are said to be "copper-fastened." The first ship in the navy to be copper-bottomed was the frigate *Alarm* in 1758. By 1783 the practice had become general. Modern iron and

Copyhold, a term applied to lands held by tenure of Copy of Court Roll (as the name partly denotes) and according to the custom of the manor. In the reign of Edward I. copyholders were still in the aboriginal state of villenage, cultivating the demesne lands of the lord merely as serfs, and having no certainty of tenure. In the reign of Edward III. they obtained a comparative certainty of tenure, so long as they performed the accustomed services; finally, in Edward IV.'s reign, they could maintain an action against their lord for trespass or wrongful ejection. The essentials of a copyhold tenure, according to Blackstone, are—(1) That the lands be parcel of and situate within that manor under which they are held; (2) that they have been demised or demisable by Copy of Court Roll immemorially. To the present day copyholds retain some traces of their frail original. Thus for some purposes the copyholder is still a mere tenant-at-will of his lands, the freehold therein remaining in his lord, who, therefore, is owner of all the mines and minerals under the land (though he cannot work them without the tenant's consent, except by a local custom), and also of the timber upon it; and the copyholder cannot without licence lease the lands for a longer term than one year, or commit any waste. Nevertheless, the copyholder when admitted is possessed of a quasi seizin of his lands; in other words, he is seised of them as against all the world except his lord. There may be all variety of estates in copyhold lands—for life, *pur autre vie* in tail, or in fee simple; but with reference to estate tail in copyholds there is some *distinction*, all manors not admitting this tenure. Copyholds were first made liable for the debts of the owner after his decease in 1833, and, in 1838, during his life. They are also liable, in bankruptcy, to the same extent as freeholds. They are devisable without any previous surrender to the use of the will, but if the owner dies intestate, they descend to his customary heir. Upon the death of a tenant, his lord is entitled to seize his best beast, and he is also entitled to

many other fines and perquisites on death, alienation, etc.

Enfranchisement of copyholds, voluntary and compulsory, has been provided for by several statutes. The effect of enfranchisement is that the lands become freehold, but with the saving of all commonable rights and beneficial limitations. Enfranchisement is now carried out in the office of the Land Commissioners, 3, St. James's Square, London, where scales of compensation, etc., can be obtained.

Copying, in its simple meaning, the imitation as closely as possible of a model. In painting the copy is often made to do duty for the original, which it sometimes fraudulently counterfeits. A familiar example of copying is the ordinary tracing of a map, or drawing, which is first taken on transparent paper, and then transferred by means of a carbon paper to the surface upon which it is intended finally to appear. For the rapid and indefinite multiplication of copies many processes have been devised, the most familiar of which are the ordinary copying-press, which finds its place in every office where it is desirable that copies of correspondence, or other transactions, should be preserved. In this case a special kind of ink is made to transfer the writing under heavy pressure to one or more prepared papers. Another familiar contrivance for copying, which, with slight modifications, and under many names, is largely employed, has for its principal feature the transfer of a document written with a special ink to the surface of a composition which takes a negative of the writing, and from which a multitude of copies may be taken by simply laying on successive sheets of paper one at a time and applying a gentle pressure. Printing is the most widely extended method of copying.

Copyright was defined by Lord Mansfield as "an incorporeal right to the sole printing and publishing of somewhat intellectual communicated by letters." It is a species of property founded on industrial occupancy, to wit, labour and invention bestowed on materials. The earliest instance of a recognition of copyright is to be found in the Charter of the Stationers' Company, granted by Philip and Mary, and in the Decrees of the Court of Star Chamber; and the first statute on the subject was the 8 Anne c. 19, which professes to have been passed for the encouragement and protection of learned men. This Act was repealed by the Statute 5 and 6 Vict. c. 45, which with some subsequent statutes now regulates the law of copyright. By the third section of the principal Act it is enacted that the copyright in every book which shall be published in the author's lifetime shall endure for the natural life of such author, and for the further term of seven years from his death, and shall be the property of such author and his assigns; but if the said seven years shall expire before the expiration of 42 years from the first publication of such book, then the copyright shall in that case endure for the full period of 42 years, and the copyright of every book which shall be first published after the death of its author shall endure for the term of 42 years

from the first publication thereof. But the right of property in copyright must be registered in the registry of the Stationers' Company, and after such registry it is assignable by a mere entry of the transfer in the same registry in the manner prescribed by the Act. International copyright is provided for by the International Copyright Act, 1886. Proprietors of copyright in works published in this country must give notice to the Commissioners of Customs, in order to have such works inserted in the Customs of copyright works prohibited to be imported into the United Kingdom or Colonies. Copyright and Performing Right, in *musical and dramatic works*, depend upon the combined effect of the 3 and 4 William IV., chap. 15, and 5 and 6 Victoria, chap. 45, under which the author is entitled to the like period as in the case of literary works. The clauses as to registration and delivery of copies apply, except in the case of performing right in dramatic works. It is a moot point whether such right in unpublished dramatic works is not perpetual. A novelist has no right to protection from dramatisation unless by himself dramatising his novel before publication. In all cases of infringement of musical or dramatic copyright an injunction may be obtained from the High Court restraining the offence, and damages or an account of the profits made by the infringer. There is also a penalty of 40s. imposed for each unlawful performance of a dramatic work. As to what is "dramatic" and who is an infringer, a song about a fire at sea is dramatic; a proprietor of a theatre who let it with the scenery, properties, and company to B was held liable for unlawful performance by B. The owner of a tavern who let a room to an intending infringer was held not liable. There is copyright in new words written to a non-copyright air, and even in a new accompaniment to an old air; also in an authorised arrangement of an opera score for the piano. The Berne Convention protects not only the performing and multiplying right of an author or composer, but gives exclusive right of translation to the former for a limited period. By the new American law performing right in music is ignored.

Coquelin, BENOIT CONSTANT, a noted French actor (b. 1841). Born at Boulogne, he entered the Conservatoire in 1859, and obtained the second prize for Comedy. He appeared at the Théâtre Français in 1860 as Gros René in *Dépit Amoureux*. He played there till 1886, and then appeared in London in 1887-88, going afterwards to South America and to the United States. He subsequently played again in London.

Coquerel. 1. ATHANASE LAURENT (1795-1868), a pastor of the French Reformed Church. After studying theology at Montauban, he became minister of the French Church in Amsterdam. In 1830 he came to Paris, where he preached till his death. In 1848 he was elected deputy to the National Assembly for the Seine department, but after the *coup d'état* of 1851 he retired from political life. Among his theological and controversial writings, his answer to Strauss's *Life of Jesus* attracted most attention. He published many

sermons, and was a voluminous preacher and a renowned orator. 2. ATHANASE JOSUÉ LAURENT (1820-1875), son of the above, born in Amsterdam, was also a famous minister of the same church. He wrote much, and his views were more advanced than those of his father.

Coquilla Nut, the rich brown mottled seeds of a Brazilian palm, *Attalea funifera*, which are three or four inches long, and so hard as to be turned into handles for umbrellas and doors, buttons, etc. The supply is declining.

Coquimbo, capital of a Chilian province, is built upon three levels or terraces. It is a fine town, and well built. The port of Coquimbo is situated upon a bay six miles S.W. The chief articles of export are cobalt, copper, manganese, silver, and some cattle and hay. The province, stretching from the shore to the Andes, contains 12,855 square miles. There is some farming in the south, and there is mining of copper, silver, and gold.

Cora, a Mexican people whose language is still current in the state of Jalisco. It is a member of Buschmann's Aztec-Sonora group, though its relations to Aztec are rather phonetical than structural; there are three varieties, Ateakari, Muntzicat, and Teakualitzigti. Type strikingly Mongolic, high cheek bones, oblique eyes, dull yellow complexion, flat features, and in habits resembling some Siberian peoples. The Coras and their Tepehuan neighbours plait their long horse-tail hair in a single tress which falls down the back. All are now settled and Christians, gradually merging in the surrounding Spanish-speaking populations.

Coracias. [ROLLER.]

Coracle, a kind of boat derived from the Keltic, denotes a kind of wicker-work consisting of a frame more or less circular, the sides of wicker-work covered by a thin layer of animal skin. In case of the larger examples the sides are made of that its occupant, on the inside, can easily carry it away. The vessel is sometimes constructed to carry one person, and sometimes sometimes taken, who kneels in the centre, placing his hands upon the sides. The vessel is of great antiquity, and is still used on the Wye and Severn, and is also used on the Irish coast. The canoe of the Indians of the Amazon like it, save that it is longer, and is made of a single piece of wood, and that it has a narrow prow and stern.

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Cora, a kind of wicker-work consisting of a frame more or less circular, the sides of wicker-work covered by a thin layer of animal skin. In case of the larger examples the sides are made of that its occupant, on the inside, can easily carry it away. The vessel is sometimes constructed to carry one person, and sometimes sometimes taken, who kneels in the centre, placing his hands upon the sides. The vessel is of great antiquity, and is still used on the Wye and Severn, and is also used on the Irish coast. The canoe of the Indians of the Amazon like it, save that it is longer, and is made of a single piece of wood, and that it has a narrow prow and stern.

Corais, or COBAY, ADAMANTIOS (1748-1833), a Greek scholar born at Smyrna. His grandfather promised his library to that one of his grandsons who should make the most progress in the study of ancient Greek, and this turned the youth's attention to the subject. Following at first his father's steps as a merchant, he finally abandoned this calling for literature, and settled in Paris. He translated Greek authors, and did much to advance Greek studies and the cause of Greek freedom. He produced a work on Modern Greek Literature, and many papers on kindred subjects, also an Autobiography.

Coral is the skeleton or shell of various members of the great phylum, the "Cœlenterata" (q.v.). A sea anemone is a good example of one of this group which has no hard parts; but in many animals very closely allied to the anemones, the animal is protected by an external coat of hard calcareous matter, which is strengthened by a number of plates radiating from the centre and alternating with the mesenteries. Such is an ordinary simple coral, such as *Caryocyathus smithi* which lives on the Devonshire coast. The majority of existing corals are not simple but colonial, living in great reefs formed by large numbers of corallites (q.v.), each one of which is based on the plan of a simple coral. Such are the large branching Madreporæ or the massive Astrean corals. As popularly used the term includes practically all the calcareous skeletons of the Cœlenterata; thus it includes among the Hydrozoa (q.v.), the massive or foliaceous expansions of *Millepora* (q.v.), and the dendroid branching Stylasters. In these the coral consists of the skeleton formed by a colony of individuals each based on the type of a Hydra (q.v.). Usually each colony consists of a double set of zooids, viz. a central "gastrozoid" surrounded by a ring of comparatively rudimentary "dactylozooids," the whole in Stylaster forming a "cyclosystem." As in Hydra the body cavity is not divided into chambers by mesenteries, there are no "septa" in the corals of this group (Hydrocorallinæ). The remaining corals belong to the class Anthozoa (q.v.), and typically all contain septa; this class contains two groups, the Alcyonaria (q.v.) and the Zoantharia (q.v.), each of which contains a series of corals. In the "Dead Men's Fingers" (*Alcyonium*) of our coasts the skeletal structures consist simply of a number of isolated spicules; but in other cases these spicules have fused into a solid mass, which forms a central axis, as in the "Red Coral" (*Corallium rubrum*), or a series of tubes united by occasional transverse layers or platforms, as in the "Organ-pipe Coral" (*Tubipora musica*). In other Alcyonaria the skeleton is of a two-fold origin; in addition to the spicules there is a central axial skeleton developed by an invagination of the base of the external layer (ectodermis); such is Gorgonia or the "Fan Corals," in which the axial sclerobasic skeleton supports the soft tissues by which it is surrounded, and in which are embedded the spicules. The "Blue Coral" (*Heliopora*) also belongs to the Alcyonaria; its skeleton is composed of tubes of two sizes: the larger (or autopores) are occupied by the sexual

zooids, the smaller (siphonopores) by the reduced, sexless zooids; the tubes are crossed by horizontal layers or tabulæ, and are strengthened by radial plates similar to the septa of the true corals; as these, however, do not correspond in number to the mesenteries they are known as "pseudo-septa." The extinct family, the *Heliolitidæ*, members of which were abundant in Palæozoic times, was a close ally of *Heliopora*. The well-known *Halysites catenularis*, or the "Dudley Chain Coral," from the Silurian rocks of Dudley, and the less known *Chaetetidæ* and *Auloporidæ*, both also Palæozoic, are also probably Alcyonarian corals.

The Zoantharia include most of the true corals, but even here the family of Black Corals (*Antipatharia*) must be excluded, as they have horny sclerobasic skeletons, and may be compared to the Gorgonias with the zooids of a six-rayed instead of an eight-rayed Alcyonarian type. The Zoantharia includes the Madreporaria or the true corals. *Caryophyllia* may be taken as a good type of these; it consists of a series of radial vertical plates or septa, which are either six or some multiple of six in number. Externally these septa expand out and unite together so as to form a closed external wall or "theca;" this is often strengthened by an epitheca deposited as a superficial crust around the coral. The axis is usually filled up by a pillar known as the "columella" but this may be absent; the columella often ends above as a knob-shaped expansion supporting the main mass of the soft parts of the coral polype, which lives in the cup-shaped depression (or "calice") at the upper side. Between the columella and the ends of the septa are often one or more circles or "crowns" of plate-like structures known as "pali." The septa may extend out beyond the side wall of the coral and form a series of longitudinal ridges known as costæ: both costæ and septa usually bear numerous outgrowths, forming either slight teeth or ridges, or long spine-like processes (synapticulæ), or flat plates running obliquely through the interseptal chambers (dissepiments), or similar plates placed horizontally and continuous right across the coral (tabulæ).

These are the main structures in a simple coral. But two of the three methods of coral reproduction give rise to colonies. The first method is by ovæ which may be carried away and grow into independent simple corals like the parent; the second, by budding or gemmation, giving rise typically to a dendroid colony; and, third, by fission, one coral splitting across into two and giving rise to massive forms. The whole colony may be formed simply of young corallites, or these may be embedded in an intermediate tissue—the coenenchyma.

The classification of the true corals is given under "Madreporaria." The corals have a somewhat restricted range both in space and depth: the reef corals are limited to a mean temperature of not below 68° F., and thus occur only in tropical seas and at a depth of rarely below 15 to 30 fathoms. They are usually very sensitive to impurities in the water, and exposure to air and brackish water is fatal; exceptions to these, however, occur. Thus a *Madrepora* lives in New Zealand in a river that is only very slightly brackish. The simple corals

have a much wider range; a few species occur on the British coasts, and some have been dredged from depths of over 1,000 fathoms.

Coral Fishes. [CHÆTODON.]

Coral Islands. Scattered over a vast elliptical area of the Central Pacific measuring some 9,000 miles in extreme length by about 4,500 miles in width, there are a series of archipelagoes consisting of numerous small, low, ring-shaped islands, or atolls. Chamisso, a German poet and naturalist, first explained how the annular form could have been produced by the greater growth of the corals on the outside of the reef where food and air were more abundant: hence the outside would grow upward while the coral in the middle would languish and die. But this theory, though adequate for atolls in shallow seas, such as those of the Persian Gulf, or parts of the West Indies, would not account for cases where the central lagoon is deeper than the zone of coral growth. Hence to explain these deep lagoons the theory of the growth of the atolls on the rims of volcanic craters was proposed. But the form and size of the islands were quite fatal to this view, as no craters were known of such vast dimensions or remarkable shapes. Moreover the existence of groups of volcanoes, all rising to within a couple of hundred feet of the surface and none rising above it, was highly improbable. Darwin pointed out that coral reefs may be divided into three classes: (1) fringing reefs occurring in shallow water and closely skirting a shore line. (2) Barrier reefs, formed at some distance from the shore and separated from it by a broad and often deep channel: such reefs may either encircle an island or group of islands, or run for hundreds of miles at some distance from a continental shore. (3) The true oceanic atolls, ring-shaped reefs, enclosing a lagoon with or without islands in it. Darwin's theory was that the reefs were first formed always on shallow shores as fringing reefs; then during a period of subsidence the reefs were carried downward, the coral polypes building upward to keep within the zone of coral growth; this would usually only be possible to the outer portion of the reefs: for the corals there would take all the food and oxygen in the water, while those nearer shore would be further handicapped by occasional floods of mud and water. Hence the outer parts of the reefs would grow upward and keep pace with the subsidence, and become separated from the receding shore by a lagoon channel; they would thus pass to the form of barrier reefs. By a continuation of this process the islands would decrease in size, and the reefs contract into a ring broken only by channels on the leeward side. By a still further continuation of the subsidence the islands would all disappear and nothing but a simple atoll remain. This theory was so simple and complete that it gained almost universal acceptance for many years, and it was not till 1863 that serious doubt was thrown upon it by the work of Semper. Since then several authors, Rein, L. Agassiz, and others, have adduced cases of atolls in various shallow seas for which the subsidence theory was not required. But Darwin

had already pointed out similar cases and that his theory was not intended to apply to them. The most important criticism was that of Dr. J. Murray of the *Challenger* Expedition, whose theory is the only one that seriously disputes the field with that of Darwin. This newer theory is based on the fact that all over the tropical seas skeletons of the organisms that live on the surface fall as a perpetual hail to the bottom; where the shells fall on submerged peaks they would in time, aided by the molluscs, deep-sea corals, etc., raise these to the zone of reef-coral growth. The ring-shaped form of the atolls would then be due (1) to the greater growth of the corals on the outside, (2) to the reefs spreading seaward on a talus of coral rock, and (3) to the removal of the inner limestone by solution: the last factor would also form lagoon channels. Dr. Murray points out in favour of his theory that so far as is known the rocks on which coral reefs have been built are always volcanic. Great stress is also laid on the asserted absence of any reefs of the thickness that must result from the subsidence method of formation. Hence it is claimed that the new theory accounts for all the facts and therefore ought to be accepted as it does not involve so many important postulates as Darwin's theory does. Speaking generally, Dr. Murray's theory has been somewhat widely accepted by zoologists but rejected by geologists, Sir A. Geikie being the principal exception among the latter. The geologists urge in objection to the new theory that the formation and deepening of lagoons by solution will not work, as no such action is seen in places that would be most favourable to it, and that the lagoons really tend to silt up. But the principal objection to it is that it leaves unexplained many facts that seem to afford evidence for the subsidence theory. It is claimed that there are coral reefs which could not be formed by the new theory. In the case of the Dolomite Reefs, the evidence of subsidence is all in favour of it. The place of reefs and reef rock is shown by the lower limit of coral growth. The borings on the Sandwich Islands show corals which have proved the existence of coral rock 500 feet in thickness, and 1,000 feet below the sea level. The lagoons and channels must have been formed by the direct evidence for subsidence given by the irregular form of the islands such as the Marquesas. The "atoll-like ridges" are found at a lower level than at the present level. The evidence for subsidence is also shown by the fact that the islands are low, and the Pacific Archipelago group or line of islands. The stationary reefs, and these the atolls, which they disappear on the other side and reappear as

small shoals and tide-washed atolls, and grow to larger and wooded islands as they approach a line of rest or elevation.

As many important conclusions rest on the theory of the formation of coral reefs, it is not surprising that it has occupied so much attention during the last few years. The few borings that have been made have done much to re-establish Darwin's theory with the limitations that he himself placed on it; but the question will probably not be finally settled until a considerable series of borings in atolls have been made. But the cost and the mechanical difficulties involved in such borings will probably long delay the application of this final test.

Coral Neck, a dealers' name for *Amadina fasciata*, sometimes called the Cut-throat Finch. A red band extends across the throat of the male, whence the popular names.

Coral Rag, or CORALLIAN stage, so named from the abundance of its fossil corals, is one of the most distinctive subdivisions of the Jurassic system, being traceable from the Mediterranean to Normandy and right across England from Weymouth to Filey. It varies much in thickness, occurring, in fact, in lenticular masses, and consists in England of rubbly limestone, true coral-reefs, grits, and clays, and of massive limestones in Switzerland, Germany, and France. In addition to such corals as *Thecosmilia*, *Thamnastræa*, and *Isastræa*, the most characteristic fossil is the urchin *Cidaris florigemma*. Oolitic limonite (hydrous oxide of iron) is worked in the Corallian at Abbotsbury, near Weymouth; and at Headington, near Oxford, a limestone in the series is much quarried for building.

Coral Snake, a loose popular name for some South American snakes marked with black, red, and yellow rings, a coloration found only in the serpents of this region. The name is often confined to the genus *Elaps*, and sometimes to *E. corallinus*. All the family Elapidae are venomous, but in the species of *Elaps* the mouth is too small for the bite to be very dangerous. The coloration of this genus is simulated by some of the Tortricidae, which are quite harmless.

Coralline Crag, a series of sands containing numerous calcareous fossils, especially Polyzoa, and having a thickness of from 40 to 60 feet, which form the base of the Pliocene series in Suffolk. It is also known as the Suffolk, White, or Bryozoan Crag, as it resembles chalk in appearance, and the prevailing group of fossils in it are not corallines (q.v.), but Polyzoa or, as they are sometimes called, Bryozoa. At the base of the series is the Suffolk bone-bed, from six inches to three feet thick, containing phosphatic nodules and water-worn teeth and bones of *Mastodon*, *Rhinoceros*, tapir, bear, whales, and sharks, together with rounded sandstone concretions, called "box-stones." The Coralline Crag is believed to have been deposited in a sea not more than 300 feet deep. It has yielded 140 species of Polyzoa; and of the Mollusca

84 per cent. are living species, and 5 per cent. are northern types.

Corallines, or NULLIPORES, the family *Corallinaceæ* among the Floridæ or Red Algæ, are distinguished by being thickly incrustated with carbonate of lime, which gives them considerable likeness to true coral. Their reproductive structures, both sexual and asexual, are in conceptacles sunk in the thallus, but with an opening to the surface at their apex. The chief genera are *Corallina* and *Melobesia*, and, though more abundant in warmer seas, they are represented on our coasts. Corallines to some extent protect rocks from denudation, and their remains, ground down by waves and blown by wind, form the "calcareous sand" of the Bahamas and Bermuda, which is in places cemented by percolating land-springs into a compact limestone.

Corallite, an individual member of a compound coral: thus an ordinary reef coral is composed of a large number of corallites.

Corallium is the name of the genus of which the ordinary "Red Coral" is the best known representative. It belongs to the class Alcyonaria (q.v.) and so is not a typical coral, the body being arranged on an eight-radial instead of a six-radial type; the eight tentacles moreover are all pinnate. The "red coral" itself is composed of a series of small spicules fused together into a solid calcareous axis; as this is deposited by the soft tissues by which it is surrounded, it is known as a "sclerobasic" skeleton. The individual zooids that form the colony occur embedded in a fleshy layer (the *cœnosarc*) which surrounds the skeleton. The best known species is *Corallium rubrum*, which lives abundantly in the shallower waters of the Mediterranean. The genus was first represented in Jurassic times.

Corallum, an entire solitary coral, used in contradistinction to corallite.

Coram, THOMAS (1667-1751), an English philanthropist, and the founder of the Foundling Hospital. He was born at Lyme Regis, and became a sailor, rising to the position of merchant captain. In 1694 he was settled at Taunton, Massachusetts, carrying on the pursuit of farmer and boat-builder. He again went to sea, and finally came to London. He took great interest in the settlement of Georgia, and was instrumental in settling English artisans in Nova Scotia. His sympathy with the sufferings of the poor in London led him to establish the Foundling Hospital in 1740, a work in which he had the sympathies of Hogarth. His works of charity impoverished him, and in his old age he was dependent upon a small annuity raised for him by the subscriptions of appreciating friends.

Corato, a town situate in a fertile plain of South Italy, twenty-five miles W. of Bari.

Corban, a Hebrew word denoting an offering to God, or something set apart for His service. The word might denote a vow to perform some

specific act, or some object set apart to pious uses. Christ in the Gospel reproaches the Pharisees for refusing their means to legitimate purposes on the ground of their being *corban*, and so dedicated to God. *Corbana* denoted the church treasury, and in the Coptic Liturgy the name *corban* was applied to the Host.

Corbel, from the French, literally *a little basket*, is an architectural term denoting a projection from a wall destined for the support of a pillar, a beam, or the like. The earlier forms of corbel were decorated only in front, having plain sides, but later examples show much decoration.

Corbet, RICHARD (1582-1635), an English bishop and poet, the son of a gardener living at Ewell, Surrey. Educated at Westminster School and at Oxford, he became Dean of Christ Church in 1620, Bishop of Oxford in 1624, and Bishop of Norwich in 1632. His chief poems were *Iter Boreale*, an account of a student's tour, and *The Fairies' Farewell*.

Corbie Steps, a corrupted form of corbel steps, are the steps in which the slope of a gable is sometimes built to avoid the monotony of a plain slope. This method of decoration is a common feature of Netherland architecture, and may be seen, at Antwerp among other places, both upon old and new buildings. Some of the colleges of Oxford also present instances of it.

Cordage is the generic term for the running rigging of a ship, and for the reserves intended to replace it. "Cable-laid" cordage is made with nine strands. Three strands are "laid" slack; and three of the resultant ropes, "closed together," make a cable or cablet. "Stroud-laid" and "hawser-laid" are other varieties.

Corday, D'ARMANS, MARIE CHARLOTTE (1768-1793), the "Angel of Assassination" of Lamartine. She was born at St. Saturnin of a noble family, having Corneille's blood in her veins. During a solitary childhood her sympathies with mankind were fostered by the reading of Voltaire's works, while a study of Plutarch filled her with old-world ideas of patriotic devotion. Although in favour of the Revolution she hated the excesses of the Jacobins, and went to Paris with the intention of avenging the wrongs of the Girondins, by slaying either Robespierre or Marat. After some difficulty she gained access to Marat with a pretended mission from Caen, and stabbed him as he sat in his bath. Brought before the tribunal she gloried in her deed, and scouted the defence of insanity set up by her counsel. A picture painted of her in the interval between her sentence and its execution is now at Versailles. She met death bravely, and it was said that her severed head blushed when struck by the executioner.

Cordeliers, monks of the Franciscan order, so called from the cord girdle which forms part of their special costume. The name was also borne by the members of a Parisian club formed in 1792, of which Danton, Marat, Camille Desmoulins, and Hebert were members. It had considerable

renown, and for a time even rivalled the famous Jacobin club.

Cordilleras (from Spanish *chain* or *ridge*) is a word used in America, especially in South America, to denote the various chains of mountains. Thus in North America the Rocky Mountains are Cordilleras, in South America the Andes, and in Central the Cordilleras proper extend from Darien to North Mexico, rising from the Isthmus of Panama to the high plateaux of Mexico, which are 17,000 ft. and upwards in height.

Cordite, a propulsive explosive, recommended by Sir Frederick Abel's Committee in 1889, and since then practically adopted as the smokeless explosive of the British services. It takes its name from its external resemblance to pieces of cord, or, more exactly, pieces of cat-gut. Its exact composition is secret; but it is akin to celluloid, and its basis is nitro-cotton. One pound of it, used as charge for a gun, gives a greater initial velocity to the projectile than is given by 3 lbs. of any of the older powders. The amount of smoke is so small as to be almost nil; the report is, however, intensified rather than lessened.

Cordoba. 1. A town in the Argentine Republic, capital of the province of Cordoba, which contains 55,000 square miles, chiefly pampas, where cattle are largely reared, the chief exports being hides and wool. The town is on the river Primero, 246 miles from Rosario, and consists for the most part of straight streets at right angles, with brick sidewalks. There is a fine cathedral of St. Peter, a good city hall, and a university. Formerly it was a great centre of Jesuit learning and education. The town is developing rapidly, and has tramways and railways. 2. A Mexican town in the province of Vera Cruz, from which it is distant about 60 miles south-west. It is surrounded by coffee plantations, and its chief trade is in coffee, cotton, sugar, and tobacco. There are many remains of the ancient Mexican civilization in the neighbourhood.

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Spanish city, capital on the right of the Sierra south-east of walls of Moorish

origin, built upon Roman foundations. The streets are narrow and crooked, and the houses are much decayed, but are often surrounded by large gardens. A bridge of 16 arches leads to the southern suburb. The cathedral, formerly a mosque, is a splendid specimen of Moorish architecture, but has been spoilt by additions which were made to render its appearance more ecclesiastical. Its one great feature is a courtyard of columns. There is a ruined Moorish palace—the Alcazar. In Moorish times Cordova was noted for its silversmiths, and for its leather which has given us the word *cordwainer*. Flax, linen, silk, and woollens are its chief productions. Once a Carthaginian settlement, it became the first Roman colony in Spain. Later it was the capital of Moorish Spain, was taken by Ferdinand in 1236, and was stormed and pillaged by the French in 1808.

Cordylophora is a very convenient type of the compound Hydroid Zoophytes, as it lives in fresh or brackish water and is common in English canals and docks, where it usually occurs attached to floating timber. It consists of a branched plant-like colony composed of two elements, the trophosome and the gonosome: the latter is the reproductive portion of the colony, and consists of a number of blunt, egg-shaped sacs (gonophores) borne at the base of the terminal branches. The trophosome is the main part of the colony, and consists of the long-branched stem (or hydrocaulus) and of the polypes (or hydranths) at the ends of the branches. The whole stem is covered by a thin membrane known as the perisarc, which extends over the gonophores but not over the polypes. *Cordylophora* reproduces by the formation of eggs on the central axis of the gonophore, which develop into free-swimming larvæ known as "planulæ" (q.v.); these become fixed by one end and grow into the adult form. The development is, therefore, said to be direct, as there is no "medusa" or jelly-fish stage as occurs in many of the Hydroids. *Cordylophora* was once a marine and estuarine form, and has only spread into fresh water during the present century.

Core, in *Engineering*, is a term employed generally to signify the interior part of a hollow body. Hollows in castings are produced by the use of cores placed in the mould. The central portion of a wall is termed its core. An electro-magnet consists of a series of convolutions of wire round a central core.

Corea, a peninsula to the south of China, between the Yellow Sea and the Sea of Japan, in lat. 34° to 42° 25' N., and long. 124° 35' to 130° 50' E., containing over 79,000 square miles. On the E. coast, which is comparatively regular, there is a large gulf—Broughton Bay—and there are several other bays and harbours, the chief being Lazaref, Pingei, and Chosan harbour. The W. coast is much indented. The country is very mountainous, and has been likened to the "sea under a gale." A range runs from N. to S., near the coast, and sends out spurs to the W. and S.W., and rises to a height of 8,000 feet. The rivers are numerous, the

principal being Ya-lu-Kiang on the E., the Mi-Kiang on the W., the Tai-Tang-Kang, and the Han-Kang, on which is the capital, Seoul. On the S. the Nak-Tong-Kang flows into Chosan harbour. The climate has a great range of temperature, and is humid. The chief vegetable productions are rice, wheat, millet, rye, cotton, hemp, and ginsengs, and the fruits of mid-Europe. Among the animals are tigers, bears, boars, cattle, a small breed of horses, swine, and dogs. There are thirteen provinces, and many towns, the capital Seoul being walled. The king was formerly absolute, but by an agreement with Japan in 1907 all administrative measures and all high official appointments are subject to a Japanese Resident-General at Seoul. There are traces of ancient cults, such as serpent-worship, and the perpetual keeping up of the hearth-fire. As in China, much reverence is paid to ancestors. Women occupy an inferior and insignificant position. The pursuits are chiefly agricultural, there being hardly any manufacture, save that of paper. The Japanese were the first to secure trading rights in 1876. From 1880-86 the rights were extended to China, the United States, Germany, Great Britain, Italy, Russia, and France. In 1895, on the conclusion of the Chinese and Japanese war, the independence of Corea was acknowledged. It was one of the debated points between Russia and Japan in the dispute between those countries which culminated in the war of 1904. On the outbreak of hostilities Corea was at once overrun with troops, and, though it declared itself neutral, it formed the battle-ground of the war for a long time, the Japanese pushing forward through the country towards Manchuria. On the conclusion of the war in 1905 Russia acknowledged Japan's paramount interest in Corea, and engaged not to interfere in any measures she might find it necessary to take in that country.

The inhabitants of Corea are usually classed with the Mongolic family, but are somewhat taller, fairer, and perhaps more robust than the average Mongol. As amongst the neighbouring Manchus, light eyes (greenish, grey, or even blue) are not uncommon, which seems to point at an early fusion of Caucasian and Mongolic elements in North-east Asia. The national records speak of two primitive races, the Sien-pi and San-San, gradually merged in the present Kao-li or Kao-ri (Coréa). Ernst Oppert (*Reisen Nach Korea*, Leipzig, 1881) everywhere met people, and especially children, with such regular features, florid complexion, light hair, and blue eyes, that they were scarcely to be distinguished from Europeans. Socially there are three distinct classes—the nobles, the common folk, and the slaves, presenting certain analogies to the caste system of India, and distinguished by their dress and speech. The hat with its enormous brim is the most striking part of the national costume. Corean culture is essentially Chinese, and Buddhism, introduced from China in 384 A.D., is at least nominally the religion of the masses. But the religious sentiment is but slightly developed. There are numerous Roman Catholic communities, French missionaries having long been labouring in this field, and an Anglican bishop was

appointed in 1890. The language is polysyllabic, of a Mongolo-Tatar type, but otherwise quite distinct and betraying only some slight analogies with Japanese. It is written with a peculiar alphabet of uncertain origin. But the Chinese system is also current, and Chinese itself is the language of diplomacy and, to a large extent, of the upper circles.

Coregonus, a genus of *Salmonidae*, with about forty species, from the northern parts of temperate Europe, Asia, and N. America. The body is compressed and covered with scales of moderate size; the teeth are very small or absent; the dorsal fin is small and the caudal deeply forked. Most of them are found in lakes and rivers, and a few descend to the sea like salmon. The American species are known as white-fish.

Corelli, ARCANGELO, called "il divino" (1653-1713), an Italian musical composer, born at Fusignano, and taught by Bassano. He went to Paris and Germany as a violinist, spending nine years at Munich, and then to Rome, where he settled, and was patronised by Cardinal Ottoboni, under whose auspices he gave noted Monday concerts. His concertos, sonatas, and violin pieces marked an epoch in music, and had great influence on Bach and other composers. Herr Joachim has edited an edition of his sonatas.

Corelli, MARIE (b. 1864), novelist, was adopted in infancy by Charles Mackay (q.v.). Her first book, *A Romance of Two Worlds*, was published in 1886, and met with immediate success. Other works include *Vendetta* (1886), *Thelma* (1887), *Soul of Lilith* (1892), *Barabbas* (1893), *Sorrows of Satan* (1895), *The Mighty Atom* (1896), *Ziska* (1897), *The Master Christian* (1900), *God's Good Man* (1904), *The Treasure of Heaven* (1906), *The Tragedy of a Quiet Life* (1908), *Holy Orders* (1908).

Corfe Castle, a village in the Isle of Purbeck, in Dorsetshire, 4 miles S.E. of Wareham. The castle is noted as the scene of the murder of Edward the Martyr (979) by his stepmother Elfrida, and the slaughter by King John of twenty knights. In 1643 Lady Bankes held it against a six weeks' siege by 600 Parliamentarians. It was afterwards dismantled, and its ruins now cover 3½ acres.

Corfu, the CORCYRA or DREpane of ancient days, the most northerly and the largest of the Ionian islands, separated from Albania by a channel varying in width from 2 to 12 miles. It has an area of 270 square miles. The climate is moderately good, the winters being rainy, and the summers hot and dry. The island is well-wooded, with the olive, cypress, and ilex, and the chief productions are olives, oranges, citrons, figs, honey, silk, and wine, and some maize. Goats are plentiful, and much oil is exported. The chief minerals are sulphur, salt, coal, and marble. Corfu, on the E. coast, has a good harbour and frequent steam communication. It is the seat of a Greek archbishopric and a Catholic bishopric, and there is a palace and an Ionian academy. In 734 B.C.

Cork. 1. A county in the province of Munster, the largest and most southerly of the counties of Ireland—110 miles long by 70 broad, and containing 2,890 square miles. The county is hilly and much diversified, being in the W. rocky and mountainous, wild and boggy, and in the S. and E. rich, fertile, and picturesque. The 250 miles of coast are bold and rocky. There are many bays, running from three to twenty-five miles inland, from Bantry Bay to Youghal harbour, the best-known being Cork harbour. Of the islands in the county, Cape Clear is the chief. The mountains run chiefly E. and W., and divide it into three principal river basins—the Blackwater, the Lee, and the Bandon. There are also many lakes. The Munster coal-field occupies the N.W., and coal, iron, copper, and marble are the chief minerals. The climate is moist, but genial, and the county is

noted for its dairy produce. The cattle are small, but yield abundance of milk. The chief trade is in leather, tweed, whiskey, malt liquor, and, above all, in provisions. Population (1901), 404,611. Cork sends seven members to Parliament.

2. The capital of the county Cork, and forming a county in itself on the Lee, eleven miles above the mouth, and 166 miles from Dublin, is partly on a group of islands forming a swamp, and partly on the banks of the river, which is crossed by a bridge. The houses, which are for the most part of old red sandstone, present a striking appearance. There is a park of 400 acres, and an elm-shaded promenade called the Mardyke, and a good cemetery. The unevenness of the land, with here and there overhanging heights, makes Cork a fine city. The church of St. Anne, Shandon, has a tower 170 feet high. The Protestant cathedral, the Bishop's palace, the Queen's College, and the Science and Art Academy are among the most striking buildings. The harbour is ten square miles in extent, and its four quays admit vessels of 2,000 tons. Seven lines of steamers visit the harbour, which is entered by a channel two miles long and one wide, and contains several large islands. It is protected by batteries, and at Spike Island there is a torpedo defence and powerful submarine batteries. Passage and Queenstown are well known as places of call for mail steamers and ships awaiting orders. The principal manufactures are leather, iron, friezes, gloves, flour, malt liquors, and whiskey, and the exports provisions, leather, tweeds, and live stock. Cork sends two members to Parliament. An abbey was founded here by St. Finbar in 600. The Danes walled the city in the ninth century, and in 1172 King Dermot McCarthy surrendered it to Henry I. It was taken by Cromwell in 1649, and by Marlborough in 1690. James II. landed here in 1688. Here William Penn became a Quaker, and a statue commemorates Father Mathew. Population (1901), 75,978.

Cork, the periderm, secondary cortex or outer-bark of dicotyledonous perennials. It consists of layers of muriform parenchyma, or brick-shaped cells, filled with air, the walls of which have undergone the molecular change known as cuticularisation or suberisation. This consists in the conversion of the permeable cellulose into the highly elastic impermeable *cutin*, which turns yellow with iodine or acid, and resists the action of the latter even when concentrated. The formation of cork, which is practically confined to the axis, begins at certain points beneath the epidermis of young green shoots, known as *lenticels*, where it ruptures the epidermis. It then extends throughout a layer known as the *phellogen* or *cork cambium*, the cells of which on dividing give rise to an inner layer of chlorophyll-containing cells, the *phelloderm*, and externally to successive layers of cork cells, the *periderm*. The formation of this layer of air-filled cells, which are, of course, physiologically dead, cuts off all external structures from the vital fluids of the plant, and it is thus that the fall of the leaf is brought about, the layer of cork extending across its base. The periderm may be of

considerable thickness, the *lenticels* (q.v.) growing with it so as to form perforations, or tubes filled with loose dried powdery cells, extending through it to the surface, as is familiar in thin slices of cork. With its growth, and that of the wood of the stem, the outer portion of the cork may be split by longitudinal furrows as in oak, elm, chestnut, etc., or it may flake off, as in the birch and plane, or by cell-division radial as well as periclinial it may accommodate itself to the increased girth, as in beech, sycamore, etc. The term cork is specially applied to the periderm of *Quercus Suber*, the Cork Oak, a native of the Mediterranean region. The first crop, taken off trees ten to fifteen years old, which is furrowed, is known as *virgin cork*, and is used to ornament ferneries. Subsequent crops are taken every seven years or thereabouts, care being taken not to injure the *phellogen*. The stripping is said to accelerate growth, though it probably renders the wood less dense. The curved sheets are flattened by weights when under water and charred to close their pores (*lenticels*). Great Britain imports about 22,000 tons of cork in the rough and over 2,000 tons manufactured. The best comes from Spain, France and Portugal also contributing. Besides its use for bungs and bottle-corks, cork is used for boot-soles and to line hats, and refuse cork treated with rubber is the material of the floorcloth known as *kamptulicon*, now generally superseded by linoleum.

Cork Leg. [LEG.]

Corkwing (*Crenilabrus melops*), called also the gold-sinny, a wrasse (q.v.), common on the British coasts.

Corleone, a Sicilian town in the province of Palermo, from which it is distant twenty miles south. It is on the slope of a hill near the source of the Belici. There are two castles, said to be Saracen, one of which is ruined and the other used as a prison. The inhabitants are descended from a Lombard colony.

Corm, a short, fleshy, underground stem, generally consisting of a single internode and enclosed in a few sheathing membranous leaves. It bears buds on its upper surface or laterally and adventitious roots below; but differs from a bulb, which it resembles externally, in being a solid stem, and not being mainly made up of fleshy leaf-scales. Corms occur in the snowdrop, *Crocus*, *Gladiolus*, and *Arum* among Monocotyledons, and in *Cyclamen* among Dicotyledons. In some Aroids corms reach an enormous size. Such a rhizome (q.v.) as that of the onion-couch may well be considered as a chain of corms, and the corm of *Arum* is sometimes termed a shortened rhizome.

Cormorant, a cosmopolitan genus (*Phalacrocorax*) of the Pelican family with thirty-five species frequenting coasts and islands. The face and throat are naked; the bill is long, and the upper mandible much curved at the point, while the lower supports a dilatable membrane which forms a gular pouch. The legs are short, strong, and abdominal, with three toes in front and one behind, all united; the claw of the middle toe is pectinated

and probably used to dress the plumage and to free the bird from insect pests. The wings are of moderate length, and the tail-feathers stiff and rigid. Many of the species develop crests or wattles in the breeding season. These birds feed exclusively on fish, of which they devour enormous quantities. Two species are British: the Great, Black, or Common Cormorant (*P. carbo*), and the Shag, Scart, or Green Cormorant (*P. graculus*). The first species has the range of the genus. Its general plumage is black, with a velvety bluish tinge on the under surface, and there is a white patch on the thigh; the feathers on the head of the adult are elongated to form a crest; gular pouch yellow, margined with white. This bird was formerly used in England, as it still is in China, for fishing. The Shag is a somewhat smaller bird, and has dark-green plumage, with metallic reflections on the under surface. It is crested like its congener. It is more essentially a marine bird than the Common Cormorant, which often nests inland. In the seventeenth century there was a colony of *P. carbo* at Reedham in Norfolk, and down to very much later some built in the trees round the decoy at Fritton, Suffolk.

Corn, a general name for the fruit of the cereal grasses (q.v.). In England the term is used generally for wheat, but by horse-keepers for oats, and in the United States it means maize. In 1888 the quantity of wheat sold in the 187 chief market towns of England and Wales was nearly 2½ million quarters, its price averaging 31s. 11d. per quarter. In the same year Britain imported 57½ million cwt., besides nearly 17 million cwt. of wheat-flour. The total imports of grain and flour in that year were valued at 51½ millions sterling, of which 16½ millions came from Russia and 15½ from the United States. In 1889 nearly 3 million quarters were sold in the market towns, and 58½ million cwt. in the rest of the country. The price was 29s. 10d. per quarter, and the average price was 30s. 7d. per quarter. In the same year Britain imported 107 million cwt. of wheat, and 17 million cwt. of flour.

Cornaro, the name of a Venetian family, of whom the most famous was Paolo (1454-1510), who married a French princess. His death started a series of events which led to the fall of the Republic of Venice. (2) LUIGI (1460-1510), a Venetian scholar, entered upon a career of moderation, and was at the height of his power when he died.

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in autumn. It is about a foot long, with reddish-brown plumage, streaked with black on the upper surface. Corncrakes are exceedingly shy, and are far oftener heard than seen. The cry, which resembles the noise made by drawing the thumbnail or a piece of wood sharply across the teeth of a comb, is uttered only by the male, and ceases after incubation. Long grass and standing corn are their favourite haunts, and, though they swim well, they do not take to water unless compelled to do so. They are much valued for the table.

Cornea, the transparent anterior portion of the eyeball. [EYE.]

Corneille, PIERRE (1606-1684), one of the fathers of French drama, born at Rouen. His father, who was an advocate, and the Master of Woods and Forests, was ennobled in 1637, an honour which was confirmed to the son in 1669. After being educated by the Jesuits Corneille became an advocate at 18. His first play, *Mélite*, was given to the world in 1629, to be followed in 1632 by the tragedy of *Clitandre*, and in 1633 by a comedy, *La Veuve*. In the next year appeared two other comedies, *La Galerie du Paris* and *La Suivante*. In 1634 he was chosen to write a Latin ode of welcome to Richelieu, who took him up, and made him one of the five poets whose work it was to polish up the Cardinal's literary work. Corneille soon displeased Richelieu, though he was afterwards restored to favour. In 1635 he produced *Place Royale* and *Médée*, and in 1636, *l'Illusion Comique*, and his masterpiece, *The Cid*. But the jealousy of his contemporary rivals drove him in disgust to Rouen, where he remained three years. In 1640 he published *Horace*, which he dedicated to Richelieu, who had taken him again into favour. He then married. His next piece was *Cinna*. In 1640 also appeared *Polyeucte*, and *Le Menteur*, which bears the same relation to French comedy as does *Le Cid* to tragedy. In 1647 he was elected to the Academy after being twice rejected. In 1653 he gave up writing for the stage, but six years later he wrote *Edipe* for Fouquet, a play which brought him to the notice of Louis XIV., and gained him a pension. From this time his pieces, except *Psyche*, in which Molière collaborated, and into which Corneille put some of his best work, fell off in power, and he sank into what was almost poverty. His pride and reserve, increased by his poverty, prevented his succeeding like Racine, with whom he holds the balance as the first dramatist of France. But he was a man of warm affections, and was very fond of his brother, who was himself a prolific writer. His great fault was a childish jealousy which, however, did not degenerate into envy. Corneille, though his work is very unequal in merit, is considered the Shakespeare of France.

Cornelia, a patrician Roman lady, the daughter of Scipio Africanus the elder, and mother of Tiberius and Caius—the two Gracchi—and of Cornelia who married Scipio Africanus the younger. After her husband's death she would not marry again, though she had a royal suitor in the person

of King Ptolemy, but gave herself to the education of her children, whom she called "my jewels." After the murder of Caius Gracchus she went into literary retirement at Misenum.

Cornelisz, LUCAS (1495-1582), a Dutch portrait painter, born at Leyden. His father, who was a painter, taught him, but he was obliged to support himself by taking domestic service, whereby he gained the sobriquet of "Kok." In 1527 he came to England, and was appointed court painter by Henry VIII. For a time he was in Italy at Ferrara.

Cornelius, PETER VON (1783-1867), the leader of the German art revival. Born at Düsseldorf, he began to paint at an early age. His first public work was the decoration of the choir of a church at Neuss. At 26 he made some designs from *Faust*. In 1811 he went to Rome, and there with his associates and disciples he inaugurated a new German school of decoration. Among his work of that period were designs from the Nibelungen Lied. He went from Rome to Düsseldorf, and from there to become director of the Munich Academy. He designed the frescoes for the Ludwigskirche, the best known being *The Last Judgment*. He also decorated the Pinakothek and the Glyptothek. At Berlin he executed cartoons from the Apocalypse for the Campo Santo, the Royal Mausoleum. Though a great and powerful designer he was of no great merit as a colourist. He followed the Italian school, though his work showed evident traces of the influence of Albert Dürer. He came to England in 1841 and was consulted upon the subject of the Parliamentary frescoes.

Cornell University, near the town of Ithaca, New York, called after its founder, Mr. Cornell. It is of considerable extent, and includes a college for women. In some respects it approaches to the nature of a communistic establishment, since its students may, if they please, support themselves by labouring for the community. In return for income secured to it by the State, the university must educate free of cost and instruct in agriculture and mechanic arts 128 students from the State of New York. The endowment of the university is about £500,000. Besides general courses in arts, literature, and science, the university gives instruction in a great variety of special subjects. Englishmen will remember that Goldwin Smith spent some time there as a Professor.

Cornet. (1) A brass soprano wind instrument which may be looked on as a modification of the trumpet, and which occupies an intermediate position between the trumpet and the bugle. It possesses three slides for producing sounds other than the open notes, and these three slides are put into operation by three valves, which have given the name of *cornet-à-piston* in French to the instrument. It was formerly called the *cornopean*, and crooks were inserted between the mouth-piece and the body of the cornet to alter the pitch, but these are now obsolete. As the instrument is a comparatively modern invention, no provision is made for it in ancient orchestration, but it is much used both in combination and as a solo. Military bands

often employ a smaller kind of cornet. The organ sometimes possesses a cornet stop. (2) From Italian *cornetto* (a small flag), denoting the junior grade of commissioned officers in a cavalry regiment, equivalent to *ensign* in the infantry, whose special duty it was to carry the standard. At the army changes in 1871 this rank was abolished, the junior grade of officers in the cavalry as in the infantry being called sub-lieutenants.

Corn-flour is made by finely grinding maize.

Cornish, the inhabitants of Cornwall, present a red and a dark type, some being the darkest people in England. There appears to be a primitive Iberian substratum mixed, at an early date, first with Gadhælic and later with Kymric Celts. [CELTS.] Prof. J. Rhys thinks that Gadhælic survived in Cornwall down to the sixth century, after which Kymric became the exclusive language, gradually yielding to English and at last dying out about 1770. Except some glosses and the Cotton MS. vocabulary, the oldest known specimen of Cornish is 36 lines of a drama discovered in 1877 by Henry Jenner on the back of a charter of about the year 1400. The language still lives in the universal geographical nomenclature, such elements as *tre* (village or town), *pol* (lake, pool), *pen* (head, crest) occurring at every step, whence the local saying, "By tre, pol, and pen, you may know the Cornishmen." The numerous so-called druidical remains (dolmens, menhirs, hanging stones) are generally attributed to the Celts, but they must obviously be referred to the same race that erected similar structures in Brittany as well as in North Africa and other regions where the presence of Celts has never been suspected. This race represents the non-Aryan element occupying West Europe before the arrival of the Aryan Celts, and now merged with them.

Cornish Boiler, a cylindrical steam-boiler with a single flue passing from end to end. The diameter of the flue is usually three-fifths of the diameter of the boiler itself. The furnace is built in the front part of the flue; it is backed by a bridge of firebrick or of hollow metal, inside which the water may flow. Effective eddies are produced in the flow of the burning gases by corrugating the flue and by the use of Galloway tubes. These latter are hollow tubes joining opposite sides of the flue, thus permitting the water to flow across and so be heated. Besides increasing the heating surface, they strengthen the structure considerably.

Cornish Engine is an old type of single-acting beam-engine, employed in pumping water up from mines. The steam is carefully economised, and is used expansively.

Corn Laws. In England, those laws which for a long period regulated the import and export of corn to and from the country. In 1360 a law was passed prohibiting the export of corn without the king's licence, and a law of 1436 enacted that corn should not be exported if the price were more than 6s. 8d. per quarter. A law of 1463 enacted that no imports should be allowed till the home price exceeded 6s. 8d. per quarter. By the law of

1534 all export was prohibited, but a law of 1562 allowed it when the price was under 10s. per quarter. After the Restoration, Scotland, which had under the Commonwealth occupied the same position in this matter as England, had its own regulations, and the two countries treated each other on questions of corn trade as foreign nations. In 1670 importation was not allowed till 53s. 4d. per quarter was reached, and a heavy duty was imposed, and in 1689 a bounty of 5s. per quarter was granted until 48s. had been reached, in order to encourage exportation, for at this period the country produced more corn than she could consume. Other changes were introduced from time to time, and the increase of population and altered circumstances led to the abolition of bounties in 1814. In 1815 no importation was allowed while the home price was below 80s. In 1828 the sliding scale, by which the duty lessened as the price rose, was introduced more systematically than before (it had first been adopted in 1791), but this was objectionable as leading to a great deal of speculative gambling. In 1842 Sir Robert Peel modified the sliding scale, but Protection of British corn growers was still looked on as a fundamental principle of national economy. The feelings of the country at this period are fully reflected in the cartoons of the early volumes of *Punch*. In 1836 an agitation had already begun in favour of an abolition of restrictions upon free trade in corn, and in 1839 this led to the formation of the Anti-Corn-Law League. In 1846 Sir Robert Peel was converted to its views, and free trade was inaugurated. There exists a lithograph dedicated to Richard Cobden to commemorate the triumph of the League, and in this, amid emblems of Commerce, Freedom, and Industry are busts of the three chief promoters of the movement—Cobden, Bright, and Villiers.

Corns. A term applied to the corn of the foot from undue pressure, and which, if continued, leads to such a degree of inflammation as to produce a horny outgrowth. The term is also applied to the corn of the human hand, and may, if neglected, lead to the formation of a treatment of the trouble, the patient must exert undue pressure on the foot must be removed, and the corn must be removed.

The second part of the corn is the part which is the most painful, and is the part which is the most difficult to remove. It is the part which is the most difficult to remove, and is the part which is the most difficult to remove.

The corn is a disease of the foot, and is the most common of the diseases of the foot. It is a disease of the foot, and is the most common of the diseases of the foot.

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Cornulites, a somewhat anomalous genus of fossil worm-tubes found in the Silurian and Devonian rocks. The best known species is *C. serpularius*, which is abundant in the Wenlock limestone around Dudley. In its young form it is adherent to shells, but the adult is free; in this case it consists of a ringed cylindrical tube. They often grow in groups, and are then rectangular in section; as these are marked by external longitudinal ridges like "costæ" (q.v.), and as the chamber is in some species divided by a series of horizontal layers, like *Tabulæ* (q.v.), they present a certain resemblance to corals. The whole group is in need of revision, especially as it has intimate affinities with the supposed Pteropod *Tentaculites*.

Cornwall, a county at the S.W. extremity of England, the southernmost of the English counties. It forms the peninsula that lies between the Bristol and English channels, and is at no point more than twenty miles from salt water. It is eighty-one miles long by forty broad, and contains 1,365 square miles, and includes the Scilly Isles, which lie twenty-four miles west. More than half is cultivated, but much is moorland, mountain pasture, and rugged, being a continuation of Dartmoor, and forming the watershed between the two channels. The greatest height attained is 1,368 feet in Brown Willy. The chief rivers flow to the south. There are two harbours on the N. coast—Camel, with Padstow and the bay of St. Ives. The cliffs are bold and steep, and are alternated in parts by drifting sea-sand, which has swallowed up churches and villages. The S. coast is much indented, the largest opening being Mounts Bay with Penzance. To the E. of the Lizard is Falmouth Bay and harbour, and Plymouth Sound, and the estuary of Fowey. The river Tamar—called in its lower course Hamoaze—is navigable for nineteen miles from Plymouth Sound. The Fal, with a course of twenty miles, falls into Falmouth harbour. The Camel is twenty-nine miles long, the last ten miles of its course being tidal. Between the mainland and the Scilly Islands is said to be a submerged tract which formed the *Lyonesse* of the Arthurian legend. The soil is mainly clay-slate, with protruding granite, quartz, and felspar. But the geological nature of the country around the Lizard is very complex, and the rock is of igneous origin. The mining of Cornwall is by no means so extensive as formerly, though the county is extremely rich in minerals, of which tin, lead, copper, iron and zinc are the chief. The deepest mine—half a mile—is at Dolcoath. Tin and kaolin are the substances now most worked. Pilchard, herring, and mackerel fishing are extensively carried on. The climate, though damp, is extremely mild, and many foreign shrubs, such as the camellia, grow in the open air. The Scilly Isles have become an important source of the supply to the English market of flowers and early vegetables. The county sends seven members to Parliament. Till lately joined to the see of Exeter, Cornwall has now its own Bishop of Truro. The Duchy of Cornwall is an appanage of the princedom of Wales, and the Prince of Wales derives from this source an income of £61,000 a

year. The county abounds in crosses and cromlechs and other relics, both of early British Christianity and of still earlier periods. The Cornish language, except in isolated words and expressions, has perished. The last person who knew the language is said to have been one Dolly Pentreath, who died in 1778. [CORNISH.] Pop. (1901), 322,957.

Cornwallis, CHARLES, MARQUIS (1738-1805), English general and statesman, son of Earl Cornwallis. He was educated at Eton and at the military academy of Turin, and acted as aide-de-camp to the Marquis of Granby in the Seven Years' war. In 1762 he succeeded his father in the earldom, and in 1766 he had attained the rank of colonel. In 1770 he was governor of the Tower, and in 1771 major-general. Sent to take part in the American War of Independence, he was in 1782 besieged at Yorktown by the French and American armies and the French fleet and forced to capitulate, a step for which he was not blamed. In 1786 he was made Governor-General of India, and, besides doing much in the way of reform, he forced Tippoo Sahib into a treaty beneficial to England. After being made Marquis in 1793, he returned to India as Viceroy in 1798. After negotiating the treaty of Amiens in 1802, he was sent a third time to India, in 1805, as Governor-General, but died on his way up-country.

Cornwallis, THE HON. WILLIAM, British admiral and naval tactician, was son of Charles, fifth Lord Cornwallis, and was born in 1744. He became a lieutenant in 1761, a commander in 1762, and a captain in 1765; but although he did good service in each of these ranks and, as captain, very greatly distinguished himself on numerous occasions, it was not until after he had in 1793 attained his flag that he won his great triumph. In 1795 he was cruising with five line-of-battle ships and two frigates when he fell in with a French force of thirteen line-of-battle ships, fourteen frigates, and other craft. The manner in which Cornwallis made a running fight from the superior force, and escaped, losing no ship and gaining undying honour for his courage and skill, has never been equalled in the history of sea tactics. In 1801 he commanded in the Channel, and again on the renewal of the war in 1803, and he held the position until 1806. He had reached the rank of full admiral in 1799, and when he died in 1819 he was almost the senior officer of the navy.

Coroados, a primitive Brazilian people, formerly dominant about the head waters of the Rio Embotetin, where they were at constant warfare with the powerful Guaicuru nation. Both sexes went naked, and they were troglodytes, living in caves and the rocky recesses of the mountains. Later some became civilised, and built themselves huts four or five feet high. Some bands of Coroados are still met in various parts of the interior, where they are regarded as a common enemy by all the other natives.

Corolla, the inner floral envelope or whorl of the perianth, which is generally of a delicate or "petaloid" texture and white or coloured, serving,

at least in many cases, to attract insects (or more rarely birds) and so secure the cross-pollination (q.v.) of the flower. It may also be scented. The leaves of the corolla, which are called *petals*, have commonly a narrow base, simple outline, entire margin and broad obtuse apex, being sometimes distinguished, as in the wallflower, into a *claw* and *limb* or blade; but they may be notched, as in chickweed, fringed, as in pinks, or torn (*laciniate*), as in the ragged robin. They are generally three in number among Monocotyledons, and five among Dicotyledons; but in cultivation many flowers become "double" by the replacement of some of their stamens by additional petals. The petals may be distinct (*polypetalous*) or coherent, from intercalary growth carrying them up on a tube (*gamopetalous*); and they may spring from below the ovary (*hypogynous*), in a ring round it (*perigynous*), or from the top of it (*epigynous*). These characters are of primary importance in classification. The corolla may be *polysymmetric*, as in the rosaceous, caryophyllaceous, and cruciform types among *Polypetalæ*, and in the tubular, campanulate, urceolate, funnel-shaped, salver-shaped and rotate types among *Gamopetalæ*; or it may be *monosymmetric*, as in the papilionaceous, bilabiate and ligulate types. Flowers that are habitually self-pollinated have commonly white, uniformly-coloured or inconspicuous corollas: those adapted to insect-fertilisation (q.v.), besides being conspicuously coloured, are often marked by dots or lines known as *honey-guides* and often themselves secrete honey. In the bud the petals are variously folded [*ÆSTIVATION*], and in duration they may be *caducous*, as in the vine, falling as the flower opens; *deciduous*, falling after fertilisation; or, though rarely, *persistent*, as in *Campanula*.

Corollary, in *Logio* or *Mathematics*, is an easy deduction appended to a proposition that has been proved.

Corollifloræ, a term applied by A. P. de Candolle in 1813 to a class of exogenous (dicotyledonous) plants in which the petals are united and hypogynous, and the stamens are usually epipetalous, as in the *Labiata*, *Solanaceæ*, etc. [*GAMOPETALÆ*.]

Coromandel Coast (from *Chola*, an ancient people of India, and *Mandal*, a region), the name given to the east coast of India, from Cape Comorin to the mouth of the Krishna. The coast is constantly beaten by a heavy surf not to be faced in ordinary boats, and contains no harbour or safe place of refuge.

Corona, or CORONET. 1. A term applied to the whorl of hair-like appendages to the petals of the passion-flowers and to the similarly ligular structures that unite to form the cup or tube in the flower of *Narcissus*. It is also applied to the five teeth round the apex of the archegonium (nucule) in the *Characeæ* (q.v.), each composed of one cell in *Chara*, of two in *Nitella*.

2. In astronomy, is a very remarkable feature in an eclipse of the sun. The corona is an aureole of light surrounding the black mass of the interposed

moon, extending for several degrees from the surface, and exhibiting radial projections of varying brightness. [ECLIPSE, SUN.]

Corona Borealis, a pretty little constellation between Hercules and Bootes, the more prominent members of which are seen to form a semicircle with its convex side towards Arcturus.

Coronach, a Gaelic word used in the Scottish highlands to denote a loud choral crying and mourning for the dead. In Ireland this mourning is called "keening."

Coronation, the formal taking up by a sovereign of the regal authority as opposed to his or her accession, which takes place, as a matter of course, immediately upon the demise of the Crown. The coronation in England is an occasion of much antiquarian display and ceremony. The essentials of the coronation are the religious part of the ceremony, which consists in the crowning and anointing of the sovereign by the Archbishop of Canterbury; and the political part of it, whose most important part since 1688 is the taking of an oath by the sovereign to govern according to statutes made by Parliament, to administer law and justice in mercy, and to maintain the Protestant religion. This part of the oath led to the long postponement of Catholic emancipation owing to the conscientious scruples of successive kings. Beneath the coronation chair of England is the stone of Scone, upon which the kings of Scotland used to take their seat at their coronation. This stone, said to be Jacob's pillow, and to have been carried to Tara in Ireland and thence to Scone, seems geologically to have originated at Scone.

Coronea, a town of Boeotia, near Lake Copais. Here, in 447 B.C., the Boeotians defeated the Athenians, and in 394 Agesilaus defeated the allied Greeks.

Coronella, a widely distributed genus of Colubrine Snakes. *C. asperis*, common in the warmer parts of Europe, is found in New Forest. In colour, size, and habits it resembles the viper, and bites fiercely, but is tame in captivity. It feeds chiefly on lizards.

Coroner, a judicial officer, who, in England, is appointed by the Crown, and in Scotland, by the Lord of Session. He is now appointed in each county by the Local Government. In England, coroners were appointed by the Crown, and in Scotland, by the Lord of Session.

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coroner, whether the cause of death arose within his jurisdiction or not, shall issue his warrant for summoning not less than 12 nor more than 23 men to appear before him to inquire as jurors touching the death." The coroner has also jurisdiction to inquire concerning "treasure trove," and in some cases acts as substitute for the sheriff, as when that officer is incapacitated by interest, etc. Coroners are usually elected for life in England. In Scotland the duties devolve upon an officer appointed by the Crown and known as the "Procurator Fiscal." In the United States the coroner is elected for a specified time by the voters in each county. [TREASURE TROVE.]

Corot, JEAN BAPTISTE CAMILLE (1796-1875), a French landscape painter, born in Paris and educated at Rouen. He was apprenticed to a draper in Paris, and, in spite of his leanings to art, remained in this life till the age of 26, when he entered the studio of Machallon, and then that of Victor Bertin. He then went to Italy for many years, and in 1827 he first exhibited at the Salon of Paris his *Vue prise à Narni*, and *La campagne de Rome*, and continued to exhibit for fifty years. He was appointed to the Legion of Honour in 1846, and in 1867 was made officer of the order. As a landscape painter he followed the "poetry of the landscape" rather than realistic effects, and his works, like those of Millet, have something in them of sadness, but more of tenderness and delicacy. Among his best works are *Danse des Nymphes*, *Soleil Levant*, *Soleil Couchant*, *Effet de Matin*, *Agar au Desert*, *Souvenir d'Italie*. Two works, *Danse Antique* and *Le Bûcheron*, were exhibited after his death. Corot was of a sympathetic nature, and very kind-hearted, and was much esteemed by fellow-artists, who called him *Père Corot*.

Corozo Nut, the Spanish name for the seed of the vegetable ivory (*Phytelphas macrocarpa*), a tree allied to the palms, native to the northern parts of S. America. The albumen becomes as hard as ivory, and is turned into buttons, door-knobs, etc.; but the supply is declining. When young it is edible.

Corporation. A corporation is sometimes called an artificial person, that is, a person which exists by virtue of a legal fiction, for which purpose it must have a name. It is a body created by Act of Parliament, by charter, or by letters patent. It may be created either for trading or for general purposes. It must have a common seal, and all its contracts originally required to be under that seal. The living members of the corporation administer the property and do all the necessary acts for its acquisition and preservation, but the property does not belong to the individuals in definite shares nor to all of them; it belongs to the artificial person or to the name which the corporation has. In the case of joint stock companies and the like, no shareholder is the owner of a fractional part of the property. His share is an interest which he can transfer to others or which is transferable by will or intestacy, pursuant to the rules of the corporation.

But it is not a share like that of a tenant in common or joint tenant. Numerous relaxations of the above-mentioned rule as to common seal have been latterly admitted, and the general state of the law now is that for contracts of an ordinary everyday occurrence a seal is not necessary, and that if such contracts have been executed and the corporation has had the benefit of them, then the corporation is liable to be sued for the price, but that upon executory contracts of that sort the corporation seems to be not liable unless the contract is under seal. And the old law requiring the seal is still in force with regard to all contracts of an extraordinary kind, not within the usual business of the corporation, so that upon these latter kinds of contract, in the absence of the seal, the corporation cannot be sued, notwithstanding the contract is executed and the corporation has had the benefit of it and *à fortiori* if the contract in such case is executory. But the above rules do not apply to a corporation sole (*i.e.* a bishop or parson), but only to a corporation aggregate. Moreover, where a corporation aggregate is constituted by Act of Parliament, the Act commonly defines the mode by which and the purposes for which it may contract, and if such a corporation exceeds the purpose so defined, it cannot, even by affixing its common seal, make a valid contract, inasmuch as that would be *ultra vires*. A corporation is, of course, liable for torts. The largest class of corporations and those most varied in their object and character are lay and civil incorporations. Among these are the Universities of Oxford, Cambridge, Durham, and London, the municipal corporations of different cities and boroughs, the Bank of England, the Colleges of Physicians and Surgeons, the Royal Society, Royal Academy, and Society of Antiquaries, and numerous commercial and other companies erected by charter or by Act of Parliament.

Corpus Christi, a festival in the Roman Catholic Church which commemorates the institution of the Eucharist, and is in special honour of the Host. It was instituted in 1264, and takes place upon the Thursday next after Trinity Sunday. In France it is called *Fête-Dieu*.

Corpus Delicti, in criminal jurisprudence, the actual fact of an offence, that is, the sum total of the operation required for its commission.

Corpusculum, a term, now unnecessary, formerly applied to the structure in the ovule of Gymnospermous plants which is now known to represent the archegonium (*q.v.*). There are generally two or more corpuscula embedded in the apex of the archisperm, which in this group fills the embryo-sac before fertilisation. Each consists of a large central cell filled with vacuolated protoplasm and a rosette of small neck-cells above it.

Correggio, ANTONIO ALLEGRI (1494-1534), was born at Correggio (whence his name), in Modena. He studied anatomy under Dr. Giovanni Battista Lombardi, who is supposed to have been the model for his *Il Medico* design, under his uncle Lorenzo and others; and modelling under the sculptor Begarelli. He must have been in easy

circumstances, for he used expensive colours, and often painted upon copper. In 1514 he painted an altar-piece (now in the Dresden Gallery), and his *Arrest of Christ* is a good example of his early style. In 1520 he painted a fresco of *The Ascension*, and in 1530 one of *The Assumption*. His *Ecco Homo*, and *Cupid, Mercury, and Venus*, both in the National Gallery, are among his best works. At Venice there is *Leda, Danae, Vice and Virtue*; at Berlin, *Leda, and Girls Bathing*; at Vienna, *Jupiter and Io*; *Jupiter and Antiope* at Paris. For his *Zingarella* (at Naples) his wife is said to have been the model. Correggio is the chief of the Parma group of the Lombard school, and his distinguishing feature is his management of light and shade.

Corrèze, a French department inland, in the old province of Limousin, W. of Puy de Dôme and E. of Dordogne, in lat. 44° 55' to 45° 40' N., with an area of 2,265 square miles. Its capital is Tulle. The surface is hilly and interspersed with plains. In the N., spurs of the Auvergne Mountains separate the Dordogne and the Loire valleys, and the slopes of the mountains are clothed with forests. The soil generally is poor and thin. The chief minerals are coal, iron, lead, and alabaster. There is much granite.

Corrib, a lake in Galway and Mayo, the second largest lake in Ireland. It is of irregular shape, 25 miles long by a breadth of from 1 mile to 6, with an area of 68 square miles. The Galway river carries its waters to Galway Bay, and at the S. end the loch receives the waters of Lough Mask and some rivers by underground channels. There are some islets in the lough, and on the W. mountains rise to a height of 3,000 feet. There are stone circles in the neighbourhood.

Corrientes, a town of the Argentine republic, capital of a province of the same name, 15 miles below the junction of the Parana and the Paraguay. The name is derived from seven currents which prevail in the river. The town is surrounded by orange groves. Steamers ply between Corrientes and Buenos Ayres. The province consists of swamp, jungle, and lakes, and is well wooded. The temperature is high. Cattle raising is the chief industry.

Corrosive Sublimate, a chloride of mercury represented by the formula $HgCl_2$, *i.e.* *mercuric chloride*. It is generally made by heating a mixture of mercuric sulphate and salt, when the chloride sublimes over. It is slightly soluble in water. It is very poisonous, and its solution is used largely by taxidermists and entomologists for the preservation of specimens. It is employed in the formation of various chemical and pharmaceutical preparations, as Nerster's test, sal-alembroth, fusible and infusible white precipitate, etc.

Corrugated Metal, a device for strengthening metal structures by the employment of corrugations in the metal employed. It has been extensively adopted for temporary buildings, sheet-iron coated with zinc being most generally used. Boilers and boiler-flues are much strengthened, and their heating surface increased, by being corrugated.

Cortes, HERNANDO (1485-1547), a Spanish soldier and statesman, born at Medellin, in Extremadura. He studied at Salamanca. He went to San Domingo in 1504, and accompanied Velazquez in an expedition to Extremadura, and was appointed alcalde in the capital. In 1518 Velazquez fitted out a trading expedition to Mexico, and gave Cortes command of the force, consisting of 550 Spaniards, 2,000 or 3,000 Indians, 15 horses, and a few guns. At Trinidad orders came to Cortes that he was superseded, but these orders he refused to obey, and persuaded his men to side with him. Having thus passed the Rubicon, he set out upon that romantic career of conquest which made him the glory of his day and a wonder for all time. Having entered Yucatan, he had his first battle with the natives at Tabasco, and was victorious. Here it was he met with his interpreter Donna Marina. The simple natives, who had never before seen horses or white men, were overwhelmed with awe, and looked on the Spaniards as gods and as children of the sun. Montezuma, the Mexican king, sent them presents, but begged them not to visit him. This, however, did not suit the plans of Cortes, who was already revolving his audacious schemes of conquest. His first step was to found Vera Cruz, and he then sent word of his doings to the Emperor Charles V. Then he burnt his ships, and marched against the republic of Tlaxcala, and subdued it. As the Tlaxcalans were at enmity with Montezuma, they became the faithful and valued allies of Cortes. At Chohela Montezuma made an attempt to surprise and capture the Spanish

general, but failed. Cortes advanced, and soon reached the great city of Mexico, which was situated on a great salt lake communicating with a fresh-water one, and only to be approached by three causeways, protected at each end by draw-bridges. By the aid of his 300,000 Indian allies he seized Montezuma, and held him as an hostage. In the meantime a Mexican force had attacked Vera Cruz and had slain a Spaniard, which proved that the new-comers were, after all, mortal like other men. Cortes in revenge burnt to death seventeen officers, and compelled Montezuma in chains to witness their sufferings. He still retained the king in honourable captivity, and forced him to an act of vassalage to Charles V., and to pay 100,000 ducats.

Cortes acted like the great statesman he was; he searched for mines, forbade human sacrifices, and tried to give the Mexicans some idea of eastern civilisation. Hearing that an expedition had been sent against him by Velazquez, he left his lieutenant Alvarado with 200 men, and went with the rest against his new foe, whom he conquered, and whose men he won over to his own ends. Hearing from Alvarado that he was besieged by the Mexicans, Cortes, in June, 1520, met the Mexican army under Montezuma's brother, who had taken the place of the disgraced king, who was wounded by his own subjects while he was attempting to make peace, and either died from his wounds or of a broken heart. The Spaniards were obliged to make a disastrous retreat, but Cortes soon reversed the state of affairs in the battle of Otumba, where the Mexicans were tempted into trying their fate in open ground. In December, 1520, Cortes, with 500 foot, 40 horse, 9 cannon, and 10,000 Tlascalans, advanced against the city, and with ships that he had had built he destroyed the canoes on the lake, and after a desperate struggle of seventy-five days the city was destroyed in August, 1521. Cortes displayed much wisdom as a ruler and organiser, and employed his lieutenant Alvarado to carry his conquests towards the south. He returned to Spain, and was sent back, to his mortification, not as Governor, but only as Captain-general. Disgusted with the methods of government employed by his successor, he spent ten years in exploration, and in 1540 returned again to Spain. The Emperor treated him with some coldness, and though he took him on an expedition to Algeria, Cortes was repulsed when he offered to take Algiers. The rest of his life was passed in neglect on the part of the Emperor, whom he is said to have once reproached for his unworthy treatment of a man who had given him more countries than his ancestors had left him cities; and in sorrow caused by the repudiation of his daughter by her husband. Cortes was buried at Seville, but his body was afterwards removed to Tezcuco, in Mexico.

Cortex, a tissue-system, differentiated at an early period in the development of the axis of most flowering plants, between the dermatogen or rudimentary epidermis and the plerome or fascicular and medullary portion. In its embryonic stage it

is termed the *periblem*. As it passes partly into permanent tissue, its outer, hypodermal or sub-epidermal, layers of *primary cortex* frequently become *collenchymatous*, i.e. acquire a mucilaginous thickening of the corners of their cells. The inner cells may remain rounded and loosely-aggregated with intercellular spaces, and often contain stores of starch, whilst the whole tissue retains protoplasm and undergoes the cell-divisions necessary to accommodate it to the increasing girth of the axis. A layer of its cells remaining merismatic is known as the *phellogen*, and is in exogenous stems the usual source of the *periderm*, *secondary cortex*, or *cork* (q.v.). The cells beneath the phellogen generally retain their copious store of chlorophyll, which made the shoots green, even after they are buried beneath many layers of opaque brown cork. These green cells are the *phelloderm*. The elements of cortex generally remain parenchymatous, but isolated cells may become woody (sclerenchymatous), or be filled with crystals, and resin-passages and laticiferous vessels also occur in cortex.

Cortona (Lat. *Crotona*), a town of Central Italy, situated upon the top and slope of a hill overlooking the valley of Chiana and the Lake Trasymene, is 2,130 feet above sea-level. It is a very ancient city, still surrounded by the ancient "Cyclopean" walls, and containing many Etruscan and Roman remains. In its churches are several paintings of old Italian masters, and in the museum of the Accademia Etrusca are many Etruscan relics, among them a curious bronze candelabrum. In the neighbourhood is a famous Etruscan tomb.

Corunna, a fortified Spanish seaport, capital of the province of the same name, situated on a peninsula in Corunna Bay, 263 miles N.W. of Leon, halfway between Capes Ortegal and Finisterre. The Upper town has walls and bastions; and the Lower town, once a fishing quarter, Pescaderia, is now the fashionable part. There is a commodious harbour, and since 1888 a quarantine harbour has been established. There are large cavalry and infantry barracks, and a notable college. A mile N.W. is the Torre de Hercules, now raised to a height of 360 feet, and used as a lighthouse with a powerful revolving light. There is considerable commerce, but the cattle trade with Portsmouth and Plymouth, which formerly employed many vessels between those places and what English sailors called "the Groyne," has fallen off. The town imports sugar, petroleum, hides, and coal. The industries are cigar-making, cotton spinning, glass-ware, and canned meat and fish, and there is some herring and pilchard fishing. Originally of Phœnician origin, the town has interesting historical associations of later date. Here, in 1386, John of Gaunt landed to claim the crown of Castile, in 1554 Philip II. embarked for England, and in 1588 the Armada refitted. In 1809 Sir John Moore covered the embarkation of his army in the face of Soult and 20,000 men, and lost his life. He was buried on the ramparts, and a monument has been raised to his memory in the garden of San Carlos.

Corundum, from an Indian name for the mineral, is the general term for native alumina or aluminium sesquioxide (Al_2O_3). It crystallises in six-sided pyramids and other forms belonging to the Hexagonal system, and is unaltered by acids or before the blowpipe, if alone; but dissolves in borax and gives a blue colour on heating with cobalt-nitrate. It has a vitreous lustre, its hardness is 9, and its specific gravity is 3.9 to 4.1. Transparent varieties are known as sapphires (q.v.), and are the most precious of gems. The colourless form is the *lux sapphire*; the blue, *sapphire*; the red, *oriental ruby*; the violet, *oriental amethyst*; the opaque grey or brown form is *corundum*, and the impure black form is *emery* (q.v.). The precious varieties come mainly from Burmah and Ceylon; but beds of corundum, several feet thick, occur in the Alleghanies.

Corvei, an ancient Benedictine Abbey of Saxony, on the Weser. It was founded in 822 as a colony from the Western Frank Abbey of Corbie in Picardy. It was well endowed, and was a centre of agriculture and prosperity. In the ninth and tenth centuries the school of Ausgar—the "Apostle of the North"—flourished here, and ranked next to Fulda. The abbots were princes of the Empire. In 1794 Pius VI. elevated it into a bishopric. It became Prussian in 1815. The fine Gothic church contains many monuments. Though the old library and archives were in great measure destroyed, there is still a fine library in the castle, which contains some of the old records.

Corvidæ, a family of Passerine Birds, containing the Crows, Choughs, Jays, Magpies, Nutcrackers, and the Piping and Tree Crows.

Coryate, THOMAS (1577–1617), an English traveller and writer, born at Odcombe in Somerset, and educated at Westminster and Oxford. He was attached to the suite of Prince Henry, son of James I., and in 1608 he set out on a tour over great part of the East Indies, accomplishing 1,975 miles in five years. He published his journal *Coryate's History of the East's Crambe, Colenort Twine*, &c. in 1611. He set out again for Constantinople in 1612, through Persia and Afghanistan, and died in 1616. He died at Surat.

Coryban, a festival celebrated in Phrygia, who celebrated the festival with wild dances.

Corvga, a festival celebrated in the presidency of ... notable as ... which Captain ... and twenty-four ... overwhelming ... the Mahratta ...

... the flowers ... of different ... It may be ... first, as in the ... definite, the

centre flower opening first, as in hawthorn. It is thus either a variety of the raceme or of the cyme (q.v.). By this arrangement small inconspicuous flowers become collectively conspicuous, so as to attract insects. [INSECT FERTILISATION.]

Corynida, an order of the Hydroid Zoophytes or Hydroidea (q.v.). The members of this order are compound and form either plant-like or encrusting colonies. They form a skeleton or polypary, which is usually a simple chitinous membrane around the base and stems of the colony: in *Tabularia*, a common British example, the skeleton is a thin perisarc of chitin and forms a tube as far as the base of the polypes. In some the skeleton is calcareous as in some *Hydractinia*, and in the extinct genus *Parkeria*. The latter is a common fossil in the Cambridge Greensand, and occurs as spherical masses ranging up to two inches in diameter. It was once regarded as one of the arenaceous Foraminifera (q.v.), but is now usually placed in this group. *Hydractinia* is an encrusting form, and is composed of a series of layers separated by pillars. The genus began a little before the time of the Chalk, and is still living; it is the earliest of the Corynida, as the Palæozoic forms once referred to it are now known to belong elsewhere. Thus the Carboniferous *Palæocoryne* is part of a Bryozoan. The Corynida are all marine.

Coryphæus, the leader of the Greek chorus and choric dance. Formerly the leader of the ballet in the opera was a man, but in modern times the coryphée is a leading danseuse.

Coryphene, any fish of the spring-finned genus *Coryphæna* with six species from tropical and sub-tropical seas, the one (*C. hippurus*) being common in the Mediterranean. The body is compressed and elongate, and the dorsal extends from the head nearly to the deeply-forked caudal fin. The coryphenes are large and brilliantly coloured, and the flesh is well flavoured. The iridescent hues change rapidly just before death, as do those of the mackerel, a near ally. The name "dolphin" is often wrongly applied to them, and allusions to the changing hues of the "dying dolphin" really refer to *C. hippurus*.

Coryza. [CATARRH.]

Cos, a Turkish island of the Archipelago, off the coast of Asia Minor. It is 23 miles long by 5 broad, and consists partly of hills, and partly of fertile plains, which produce cotton, grain, lemons, wine, and silk, as well as the far-famed "Sultana" raisins. There are many ancient Greek remains. The capital, Cos, on the N.E. coast, has a fortress built by the knights of Rhodes, who once possessed the isle, and is said to occupy the site of a temple of Æsculapius. Apelles the painter, and Harpocrates the physician, were born here, and the wine and "Cœ vestes" were famous in ancient times.

Cosenza, capital of a province of the same name in Italy, 12 miles from the Mediterranean, and 262 miles S.E. of Naples. It is at the junction of the Crati and the Busento, the latter of which

flows through the town, and is crossed by a bridge of two arches. The town is in a deep valley where malaria sometimes prevails. There is a trade in oil, wine, silk, hemp, grain, earthenware and cutlery. Captured by the Carthaginians under Himilco, the town became Roman in 204 B.C. Alaric died here in 410 A.D.

Cosin, JOHN (1594-1672), an English bishop, born at Norwich, and educated there and at Cambridge, became Fellow of King's College, and secretary to Bishop Overall, of Lichfield, then chaplain to Bishop Neill, of Durham, and master of Peter House, and Dean of Peterborough in 1640. A friend of Laud, he hated the Puritans, who in their turn denounced his ritualistic tendencies, and found fault with the "Young Apollo," who introduced "Babylonish ornaments" and consumed much tobacco. He was deprived of his many benefices by the House of Commons, and was for nineteen years in exile at Paris. At the Restoration he was made Bishop of Durham, and established a model diocese on which he spent much of his great revenues. He was fully alive to his dignity as Prince-Bishop, and though a High Churchman, was a strict Sabbatarian, and he persecuted Catholics and Puritans with equal impartiality. Of his writings, the chief are, his *Private Devotions*, and his *Correspondence*. He had a share in the final revision of the Book of Common Prayer.

Cosine of an Angle, in *Geometry*, means the number by which any length on the one bounding line must be multiplied in order to give the length of its projection on the other. If the angle is zero between two lines, they are parallel, and the projection is equal to the original length. Hence the cosine of 0° is unity. Similarly we see that the cosine of 90° is zero, and, taking regard of the sense or direction in which the bounding lines are drawn, it follows that the cosine of an angle between 90° and 180° must be negative, diminishing to -1 at 180° . For no angle can it exceed unity. For cotangent, cosecant, and other such functions, see TRIGONOMETRY.

Cosmas, an Alexandrian merchant of the sixth century, who, after travelling in the East, retired to a monastic life in Egypt, and wrote a work on *Christian Topography*, in which he set forth some astonishing views of the universe, which he described as oblong, after the model of the tabernacle in the wilderness, with four walls and a roof, the earth lying in the middle, surrounded by the ocean, outside of which lay the Garden of Eden. His travels in India gained him the name of "Indicopleustes."

Cosmas, with **Damian**, two saints commemorated in the Canon of the Mass. They were Arabian brothers and physicians of the third century, living in Cilicia. They suffered martyrdom by beheading.

Cosmetic (from Gk. *kosmeō*, to adorn) signifies any substance used to improve the skin and hair. For their variety one has only to glance at the myriad advertisements which fill our papers and

magazines. The best cosmetics are often said to be water, fresh air, and exercise, and an improved taste and a healthier physical condition of the modern woman have almost led to the abandonment of the coarser kinds of cosmetic, except upon the stage or for exceptional purposes.

Cosmogony (from the Greek *kōsmōs*, signifying order, and hence "the universe," and *gēnōs*, birth) is applied to any theory of the origin of the world. Though, almost at the dawn of intelligence, man is likely to be impressed with the orderly or regular and inevitable sequence of natural phenomena, a sequence without his or his fellows' interference and beyond their control; yet it seems that in the lowest stages of culture, as among the Eskimos, no comprehensive theory of the kind is conceived. Where we find, among primitive and ancient races, such a theory to exist, it may be explained either, as by the late Earl Crawford, as a traditionary and more or less corrupt survival of a Divine revelation, or, as in the speculations of the so-called "science" of religion, as man's earliest and unaided gropings after truth.

"There is a consensus of opinion that, before the present order of things, water held all things in solution" (Cheyne); but it is by no means clear that the earliest views imply the pre-existence of matter before the creative act. Though the Hebrew word for "create" did originally mean "carve," whatever may be the relation of the second verse in the Bible to the first, and though the interpretation of them as "creation out of nothing" may have originated late in the history of Jewish thought, we have more explicit statements in early Hindu literature. Though it is stated that in the S'atapatha Brāhmaṇa of the White Yajur Veda, which dates at latest from the 12th century B.C., primeval waters and the world-egg produce Prajāpati, the Creator, Professor Wilson, a high authority, states that "the general tendency of the Vedas is to show that the substance as well as the form of all created beings was derived from the will of the Self-existing Cause." In this same Brāhmaṇa we find the first mention of the curious myth that the world is supported on a tortoise, the tortoise on an elephant, the elephant on another tortoise, and so on. The Institutes of Manu (about 900 B.C.), though more mythological, are still distinctly monotheistic. "The Self-existing Power, having willed to produce various beings from his own Divine substance, first with a thought created the waters, and placed in them a productive seed" which became a golden world-egg in which the Supreme Being was Himself born as Brahmā, the Creator.

The world-egg, ridiculed by Aristophanes in the *Birds*, is a natural fancy common also to Phœnicia, Egypt, China, Polynesia, and Finland. The dome-like appearance of the sky might well suggest it, as the mud of a pool teeming with aquatic life might suggest the procreant nature of water. In both Phœnician and Egyptian cosmogony we seem to have the concept of sexual generation, at least as a simile. The deity is one, a spirit or wind which "makes pregnant" a chaos

Costa Rica, the southernmost of the republics of Central America, extends from sea to sea, and from Colombia to Nicaragua. It contains six provinces, and has an area of 20,000 square miles. The white men of the country are mostly of pure Spanish descent. The country is mountainous, and has many volcanoes—none above 12,000 feet high. The Atlantic side is covered with forests, but on the Pacific slopes savannahs prevail. The climate is mild and temperate, and the land is fertile and rich in minerals—gold, silver, copper, and others. There is some agriculture, but the population is scanty, and not more than $\frac{1}{10}$ th of the country is under cultivation. The chief production of the country is coffee, for the growth of which the soil is eminently fitted. It also produces good timber and dyewoods, which it exports together with sugar, caoutchouc, hides, sarsaparilla, and tortoise-shell. The imports are principally grain and manufactured goods. The chief ports are Punta Arenas and Limon, the latter of which is connected

by a railway 118 miles long with San José, the capital. San José was much damaged by an earthquake in 1888. The government is carried on by a president and congress elected every four years, and there is a small standing army of 1,000 men, and a militia of 5,000. The Catholic religion is established, but religious freedom is guaranteed. The revenue is chiefly derived from a monopoly of spirits and tobacco.

Costello, LOUISA STUART (1799 - 1870), an English authoress. She was originally a miniature painter, and was patronised by the Burdetts. Her first literary production was a collection of poems in 1816. In 1825 she published another collection, illuminated by herself and her brother. Her *Specimens of Early French Poetry* (1835) brought her the friendship of Moore and Sir Walter Scott. But she is chiefly remembered for her bright description of travel in many parts, and some semi-historical novels. In 1852 she received a small Civil List pension.

Coster, properly LAURENS JANSZON (about 1370-1440), said by the Dutch to have invented printing. He was born at Haarlem, where he passed his life, and died of the plague. A controversy as to the respective claims of Coster and Gutenberg to the invention of printing is not yet finally settled.

Costiveness. [CONSTIPATION.]

Costs, in the technical sense of the word, are the expenses incurred by parties in legal proceedings. Particular importance attaches to the principle and practice of costs, since, though in themselves incidental and subordinate to the main cause of action or suit, it often happens that they become a chief object of contention. *Costs between solicitor and client* are those which the client always has to pay his solicitor whether such client be successful or otherwise, and over and above what the solicitor gets from the opposing party in case of such party having lost the action. *Costs as between party and party* are those which the defeated party has to pay to the successful party, as a matter of course. Costs of and incident to all proceedings in the High Court are now in the discretion of the court, but there is a saving for the right of a trustee, mortgagee, or other person to costs out of a particular estate or fund, and it is also provided that where any action is tried by a jury, the costs shall follow the event unless the judge by whom such action is tried or the court shall, for good cause, otherwise order. Costs of any kind are subject to taxation by appointed officers. As regards costs between solicitor and client, if more than a sixth of the amount of the bill be taken off, the solicitor has to pay the whole costs of such taxation. [TAXATION.]

Cosway, RICHARD, R.A. (1740-1821), an English miniature painter, born at Tiverton. He showed early talent, and his father—master of Tiverton school—sent him to London, where he studied under Hudson, and at the Royal Academy. He became A.R.A. in 1770, and R.A. in the following year. In oils he took Correggio as his model, but

it was miniature painting that brought his fame. He was appointed painter-in-ordinary to the Prince of Wales, and painted Mrs. FitzHerbert and others of the Prince's circle.

Côte d'Or, a department of E. France, forming part of the old province of Burgundy, having an area of 3,380 square miles. A chain of hills linking the Cevennes and Vosges mountains, and separating the basins of the Seine and Saône, traverse the department. The special Côte d'Or, renowned for its wines, lies S. of the capital—Dijon. There is much forest and good pasture with fertile valley and plain. The department is drained by the upper Seine, with its tributaries, the Saône and the Arroux. It is connected with all the surrounding seas by a system of canals, the Burgundy Canal connecting Saône and Yonne. The climate is temperate, and the soil stony and rich. Among the minerals are coal, iron, gypsum, marble, and lithographic stone. There are several manufactures, and horses, cattle, and sheep are reared.

Cotentin, THE, a peninsula in the N.W. of Normandy, jutting into the English Channel between St. Michael's Bay and the Gulf of Carentan. It is in the department La Manche, and is 55 miles long by 25 broad. There were many baronies and abbeys here under the Dukes of Normandy, and many Norman names now naturalised in England have their originals in this district. The land is fertile, and there are abundant flocks and herds. The old capital is Coutances, but the most important town is Cherbourg.

Cotes, ROGER (1682-1716), an English mathematician, much esteemed by Sir Isaac Newton, who, on behalf of science, lamented his early death. He was born at Burbage, near Leicester, and educated at St. Paul's and at Trinity College, Cambridge, of which he became Fellow in 1705. In 1706 he was appointed Professor of Astronomy and Natural Philosophy, and took orders. His chief work was a preface to Newton's *Principia*. Many of his papers on pure mathematics were published after his death.

Côtes du Nord, a French department of Brittany with some neighbouring islands, having an area of 2,659 square miles. The Menez Mountains traverse the department from E. to W., and are about 16 miles broad with a maximum height of just over 1,000 feet. The soil is principally granite and clay-slate, and the rivers are short but navigable. There is much heath and wood, with many fertile tracts. Flax and hemp are grown in the hilly parts, where are also good pastures, and iron is found there. In the lowlands, grain, pears, and apples and other fruit are grown, and horses, cattle, sheep, and goats are reared. The capital is St. Brieuc.

Cotgrave, RANDLE (early seventeenth century), an English writer, born in Cheshire, and educated at St. John's College, Cambridge, of which he was Fellow in 1578. He was secretary to William Cecil, Lord Burleigh. He published a Dictionary of the French language in 1611, which is valuable

as giving some ancient and now obsolete words, and also as showing the forms and mode of spelling then in use. The second edition was published (1632) during his life. Many revised editions of the Dictionary have appeared.

Cotillon (fr. French for *petticoat*), originally a dance in which two, or eight, or more performers figured. It was the forerunner of the quadrille. In some ball-rooms of modern times the cotillon has been made the occasion of a senseless, lavish, and ostentatious display of wealth.

Cotingidæ, a family of Passerine birds, with nearly 100 species, chiefly from the equatorial forest region of the Amazon. Many of the forms are extremely beautiful, *e.g.* the Pompadour, the Bell-bird, the Cock of the Rock, the Umbrella-bird, etc. Some authors use the trivial name "Chatterers" for this family, others apply it to the Ampelidæ.

Cotman, JOHN SELL (1782-1842), an English painter, born at Norwich, and educated at the grammar school there. He came to London, where he made the acquaintance of Turner. In 1807 he was teaching drawing and doing art-work at Norwich. In 1834 he was appointed drawing-master in King's College, London. His water-colour landscapes are gaining in reputation, and some consider him the best of the "Norwich school" of painters.

Cotoneaster, a small genus of shrubs and small trees belonging to the order *Rosaceæ* and natives of the northern hemisphere. They have small, simple, entire, leathery leaves, sometimes evergreen, with deciduous stipules; small white or pink flowers; and a small, scarlet, or less commonly black, pomaceous fruit with a bony core of from two to five carpels which partly project at its apex. One species, *C. vulgaris*, grows wild on the limestone cliffs of Great Orme's Head, Carnarvonshire, and several others are cultivated, especially for their ornamental clusters of scarlet fruits which remain long on the bush.

Cotopaxi, a volcano of the Eastern Andes, in the republic of Ecuador, S.E. of Quito. It is the loftiest mountain in the world, being nearly 20,000 feet high, and rises, however, from the sea-level, from 4,400 feet, to a summit of bare rock. Below the summit, which come by a space of 1,000 feet, are the forests. The smoke, explosions take place, flames, smoke of the volcano. There was an eruption at irregular intervals, when the volcano were others. Humboldt heard of the eruption, but the top of the volcano among

S.W., from Chipping Camden by way of Cheltenham and Stroud to near Bath. It is 50 miles long, with an average height of 500 to 600 feet. The highest point is Cleeve Hill, 1,134 feet. The hills separate the Lower Severn from the sources of the Thames.

Cotta, BERNHARD, German geologist, was born at Little Gilbach in 1808, and after studying at Freiberg in Saxony from 1827 to 1831 obtained a professorship in that town in 1842. He died in 1879.

Cotta, JOHANN FRIEDRICH FREIHERR, publisher, was born in 1764 at Stuttgart, studying first at Tübingen and then at Paris. In 1787 he devoted himself to business, and originated numerous successful publications, and formed the acquaintance of the leading literary men of the day, including Göethe, Schiller, Humboldt, etc., whose works he published. He became vice-president of the Wurtemberg Chamber of Deputies, and in 1815 was the representative of the Booksellers' Corporation at the Vienna Congress. He died in 1832.

Cottbus, a town of Brandenburg in Prussia, on the right bank of the Spree, 43 miles S.S.W. of Frankfurt. It is a walled town, with fine public buildings and extensive manufactures of woollens, linen, hosiery, and tobacco, and a flourishing export trade.

Cottin, SOPHIE RISTAUD, authoress, was born at Tonneins in 1773, and in 1790 married a Parisian banker. Left a widow in early life, she published several successful romances, including *Elizabeth, ou les Exilés de Sibérie*, *La Prise de Jericho*, *Claire d'Albe*, and *Malvina*. She died in 1807.

Cottle, JOSEPH, publisher and author, born in 1770, settled in business in Bristol in 1791, and there formed a friendship with the "Lake" poets, whose works he published on generous terms. He retired from business in 1799, and was the author of *Recollections of Coleridge*, severely criticised, and several obsolete works. He died in 1853.

Cotton, the hairs on the testa or outer coat of the seed of various species of *Gossypium*. *Gossypium* is a small genus of *Malvaceæ*, including some twenty or thirty species, natives of the warmer parts of both hemispheres, three of which yield all the cotton of commerce. They are all perennial plants, though outside the tropics they practically become annuals. They have, scattered, three to five-lobed leaves, which are cordate in *G. barbadense*, round-based in the eastern species. The flowers are usually large and showy, being, in a wild state, yellow with a red centre in *G. barbadense* and *G. herbaceum*, pink with a red centre in *G. arboreum*. The seed in *G. barbadense* is sometimes black and has only long hairs upon it, whilst those of the eastern species have commonly also a down of short hairs. The hairs, which are unicellular, and are practically pure cellulose (q.v.), are from an inch to an inch and three-quarters in length, and the seed itself contains a considerable quantity (30 gallons to the ton) of a bland

Cotopaxi, a volcano of the Eastern Andes, in the republic of Ecuador, S.E. of Quito. It is the loftiest mountain in the world, being nearly 20,000 feet high, and rises, however, from the sea-level, from 4,400 feet, to a summit of bare rock. Below the summit, which come by a space of 1,000 feet, are the forests. The smoke, explosions take place, flames, smoke of the volcano. There was an eruption at irregular intervals, when the volcano were others. Humboldt heard of the eruption, but the top of the volcano among

non-drying oil which is used in a crude state in soap-making and instead of linseed oil, and, when refined, as an adulterant of olive oil. The refuse cake is valuable as a cattle-food. *G. arboreum*, a native of tropical Africa, has thick glossy dark green leaves, and its cotton is always white. It is grown near temples in India, to supply the triple sacerdotal thread of the Brahmans. *G. herbaceum*, apparently wild in India, with very hairy leaves, is not only the chief source of Indian cottons or "Surats," but is now also the commonest in Europe and the United States, and the sole species of China and Central Asia. In a wild state the cotton in this species is yellow. All native American cottons may be united as *G. barbadense*, which may have yellow or white cotton and either black, green, grey, or white seeds. The plant in the three last-mentioned forms is covered with hairs. The most valuable variety is the Sea Island, having a fine, soft, silky "staple" as the hairs are termed, exceeding other kinds in length. Introduced from the Bahamas in 1785, it is grown on the islands and low coast of Georgia and South Carolina, and has been introduced into Queensland, Egypt, and Fiji. Other much grown American varieties are known as Uplands, New Orleans, and Bowed or short-staple cottons.

Sanscrit records carry back the use of cotton to 500 B.C., and it may have been equally long known in Nineveh and Egypt. Its cultivation was introduced into Spain by the Moors. When America was discovered cotton was found to be grown and used from Mexico and the West Indies to Peru and Brazil. The earliest known European manufacture of cotton goods seems to have been at Venice and Milan about the middle of the 16th century. Hence it soon spread to the Netherlands, from which country it was brought to Bolton and Manchester by Protestant refugees about the close of that century. Before the inventions of Hargreaves, Arkwright, and Crompton, it was only a domestic manufacture; cotton could only be used for the weft of the cloth; and our supplies of raw cotton were obtained from Southern Europe, the Levant, the West Indies, and Brazil. About 1770, planters in the Southern United States turned their attention to cotton, and they exported 138,000 lbs. in 1792, and nearly 18 million lbs. in 1800. England's total imports of raw cotton in 1751 were under 3 million lbs., but in 1800 they exceeded 56 millions. In 1907 the United States exported cotton to the value of over 80 millions sterling, of which over 46 million pounds' worth came to Britain, and our total import of raw cotton was valued at 70 millions and our exports manufactured and raw at over 110 million pounds sterling. Besides the United States, Egypt, India, and Brazil are now our chief sources of supply. The total cotton production of the world is now estimated at 16,000,000 bales annually, of which the United States produces two-thirds and India one-eighth.

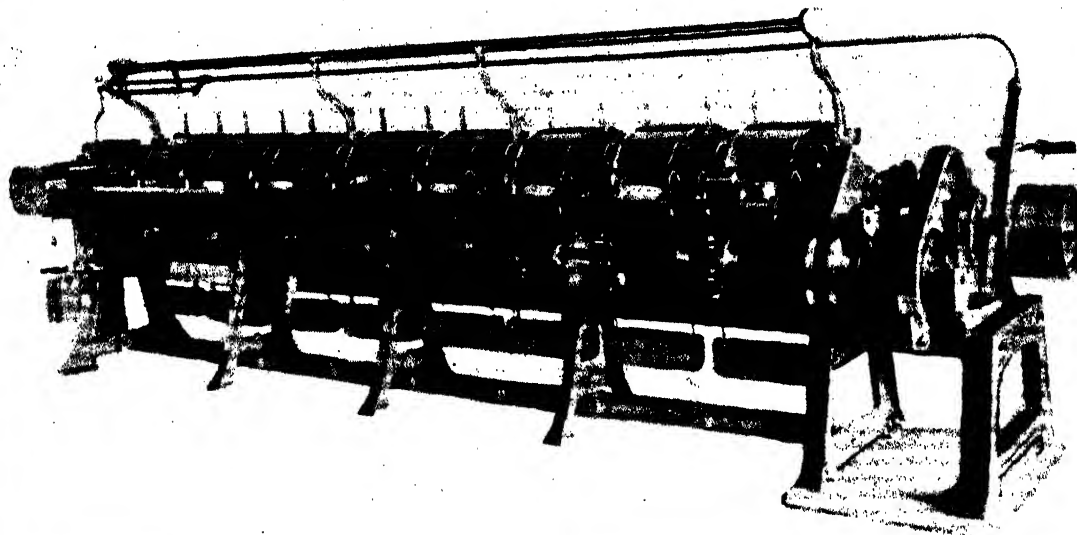
The cotton harvest in America is from August to December. The cotton, when picked and dried, is separated from the seeds, about two-thirds of its bulk, by a process called "ginning," the two chief types of machine used being the *saw-gin* and the

roller-gin, the former for short staple, the latter for long. It is then packed in bales of 400 to 500 lb. weight. Successive mechanical inventions having made what was once the product mainly of labour almost entirely one of capital, Great Britain, with her supplies of coal, has been able to furnish the world with most of a commodity once brought from India, to make it an article of universal use and to hold her monopoly against all her rivals. In 1764 James Hargreaves (q.v.) invented the spinning jenny; in 1769 Richard Arkwright (q.v.) invented the spinning frame or throstle, which he supplemented with various contrivances for "opening," "scutching," and "lapping" the cotton; and in 1775 Samuel Crompton invented the "mule." Whereas formerly each spindle required one man's attention, a man can now work 2,000 spindles, and England employs more than 53,000,000 spindles, more than all the other countries of Europe together. The capital invested in the cotton trade in the United Kingdom is probably £250,000,000, and probably over five million people are dependent on it. In 1850 we exported over 1,000 million yards of cotton cloth; in 1860, over 2,000; in 1870, over 3,000; in 1880, over 4,000; and in 1908, over 5,500 million yards. Four-fifths of these exports go from Liverpool; whilst Glasgow practically monopolises the trade in Scotland, Paisley, however, producing a greater quantity of cotton sewing-thread than all the rest of the United Kingdom. The manufacture of cotton in India is growing rapidly, though the first steam mill only began work in 1854. In 1908 there were 225 mills, with 5,762,000 spindles, representing a capital of £12,700,000, and Bombay has almost wrested the Chinese and Japanese market from Manchester. India is still, however, our chief customer for manufactured cotton.

Cotton, BARTHOLOMEW DE, historian and a monk of Norwich, was the author of a work entitled *Historia Anglicana*, in three volumes, a plagiarism of the productions of earlier writers. He died about 1298.

Cotton, CHARLES, poet, was born in 1630 at Beresford, Staffordshire, and was a friend of Isaak Walton. He devoted himself early in life to literary pursuits, in which, though a staunch Royalist, he was in no way interrupted. In 1656 he married his cousin Isabella, daughter of Sir Thomas Hutchinson. No collection of his poems was published until after his death in 1687. Though constantly in pecuniary difficulties, he was both a vigorous and prolific writer. His best known works are his *Scarronides*, or *The First Book of Virgil Travestie*, published in 1664, and his translation of *Montaigne's Essays*, issued in 1685.

Cotton, SIR CHARLES, a British admiral, was born in 1753, and became a commander in 1779, and a captain in the same year. He commanded the *Majestic*, 74, on "the Glorious First of June," 1794, and the *Mars*, 74, in Cornwallis's celebrated retreat. He became a flag-officer in 1797, and was thenceforward for nearly eight years employed in the Channel. In 1807 he accepted the command at Lisbon, and greatly assisted in rendering possible



2



3



COTTON SPINNING

1. COTTON
SPINNING MACHINE.

(By permission of Messrs. Dobson & Barlow, Bolton.)

(Photo: Pictorial Agency.)

3. SPINNERS AT WORK.

(Photo: Pictorial Agency.)

Consequently, when the machine was given to the Saxons, its spindle was a poor weaver's wheel, which was unwieldy and slow. The Saxons, however, had a long spindle, which was fastened to the wall, and the wheel was attached to the spindle by a poor device, the "spinning stone" of the old-fashioned machine. The standard Arkwright's barber-

Cotton is received from America, Egypt, India, Peru, or Brazil in bales covered with coarse sacking and bound with hoops of iron. Liverpool is the great cotton market. In a Lancashire mill, in the mixing room, it is opened out. Abroad the process of "ginning" has to some extent separated from it the fibre and the seed, but much foreign material, dirt, and sometimes large stones remain to be removed. As they are pulled apart into pieces, the bales are mixed according to the quality of the yarn required, for the best all American being used. The larger the mixing the better, for one of the fundamental rules of cotton spinning is to secure uniformity, evenness, and regularity. One reel of cotton may indeed be composed of filaments from innumerable plants. A handful of raw cotton, on examination, will be found to consist of a number of fibres, matted together, and entangled one with the other. These fibres in the lowest quality cotton (East Indian) will average $\frac{3}{4}$ inch staple, and the best will measure $1\frac{1}{8}$ inch in length. A staple may be broken, but the one fibre will cling at one end to another, if the two are parallel. The loose cotton is stacked, and quantities are taken from the sides of the pile just as hay is, and they are conveyed on an endless lattice frame or "creeper" to an opening machine, and afterwards to a scutcher, or to a combined opener and scutcher, which takes out dirt and impurities from the cotton by bringing it into contact with beaters, finally delivering the material between cylinders in the form of a "lap," rolled upon a bobbin. Strong draughts blow away the dust; the process is, therefore, sometimes called "blowing." Five of the laps, resembling rolls of wadding, are fed into a finishing scutcher, further to purify the cotton and to attain the desired regularity, and from this machine one large lap emerges ready for the Carding Engine, in which it will be again cleansed. To this stage the fibres are still matted together, and lie in confusion, but the machine secures a beautiful and orderly arrangement of them. At one end of the machine the flat web from the

scutcher is drawn in, and at the other a fine gossamer film, or "sliver," issues, coiling itself automatically in a can placed to receive it. The fibres have, in passing between large and small rollers and "clearers" working on a cylinder, revolving at 165 revolutions per minute, been combed out, and laid parallel by means of the wire teeth, with which the opposing surfaces of the rollers are covered. Two forms of carding engines are in use—the "roller and clearer" and the more modern machine, which presents to the cotton a series of jointed flat cards as they revolve round the cylinder.

The cans of ribbon-like slivers are now taken to a drawing frame, in which, again to ensure strength and regularity, a number of the skeins will be united into one by what is known as a "finger and thumb" movement. Six slivers are led between pairs of rollers, and the front pair travels six times faster than the back pair, the result being that the cotton is drawn out correspondingly; and is then coiled once more into a can. Six of these slivers are removed to the next "head," and the process is repeated. A third time the combination of six is made and the sliver drawn out, so that it now contains within itself $6 \times 6 \times 6 = 216$ slivers. Should one of these slivers break the machine stops instantly. The drawing frame initiates the cotton to a prolonged series of drawings and doublings. No twist has, however, yet been imparted to the cotton, the filaments having been simply drawn out, and placed as parallel as possible. In the next machine, the slubbing frame, the cotton receives its first twist which enables it to be drawn out still finer. The slubbing frame has four separate motions, each working in conjunction with the other. (1) A roller motion for drawing out the sliver; (2) a spindle for giving the twist; (3) a bobbin for winding the sliver; and (4) a lifting motion which raises the bobbin up and down in order that it may be properly filled. The cotton wound upon the bobbins is removed to the intermediate frame, which unites the contents of two bobbins into one, the cotton being made finer and more rounded, giving this time in the result a combination of 432 of the original slivers. All these "fly frames" resemble each other in mechanism, the difference being in the varying arrangement of the rollers to give out a fixed quantity of sliver, and to impart the needful twist to the filaments. In winding the roving upon the bobbin it is necessary to adapt the motion to the shape of the cone. This does not seem a difficult matter, but, as an expert points out, "it involves the nicest calculations in mechanics; and is far too complex to be understood by the casual and unscientific observer. It is accomplished by an ingenious arrangement of wheels working with differential movements, in conjunction with a pair of cones which give compensating effects as the roving assumes the cone shape on the bobbin." Next the cotton is dealt with by the jack or roving frame which completes the work of preparation, and as another doubling takes place the number of the original carding slivers in the roving now stands at 864. The roving is weighed and tested to ascertain whether it is in

accordance with the count which has to be spun. By the "count" is meant the degree of fineness. Cotton-yarn, if wound into hanks from the cop contains 840 yards in each hank, and the count indicates the number of these hanks to a pound weight of yarn. Some spinners produce 220 hank to the pound, that is to say, 220×840 yards of yarn = 184,800 yards.

Roving is converted into yarn by the spinning machines, sometimes by throstle and ring, which have a continuous motion instead of the intermittent one which is one characteristic of the self-acting mules and also dispense with the travelling carriage. A mule is a wonderful machine to behold. A pair of mules face each other, and they are in charge of a minder and a boy "piecer." Both man and boy work barefooted in the hot room, a temperature of 90° being necessary to keep certain parts of the machinery—sheep-skin covered rollers—in a condition to prevent the cotton from adhering to them. There may be as many as 1,296 spindles to each mule, and these are ranged in one long line upon a travelling carriage or frame, which runs outwards on wheels a space of 64 inches every quarter of a minute and then returns upon its little tramway. At the back of each mule are placed the bobbins of rovings in creels. Below them on the beam or fixed part of the machine are pairs of rollers which bring about more doubling by uniting the contents of two bobbins into one and drawing them out together to the required length. When the travelling carriage is nearest to the bobbins the roving is attached to the spindles, which, as the journey outwards is begun, revolve at the rate of 10,000 revolutions per minute. The yarn is drawn out as the carriage moves away, the spindles meanwhile giving the twist to the strands. Then for a moment the carriage stops, the spindles cease to rotate, and the rollers to give out rovings. The spindles then "back off" by unwinding the thread attached to them. As the carriage returns to the frame the yarn, by a kind of wire finger, termed a "faller," is wound round the spindles in the form of a cone, which is called a "cop." It may take several journeys to complete the cop, but when this is done the machine stops, and the spindles are cleared and started again with a fresh supply of roving. This is called "doffing." Obviously, during the progress of the work the slender threads are liable continually to break, and it is the duty of the piecer by a dexterous movement to unite the two ends. The piecing is done with incredible rapidity, for the moments available are limited, and quickness of eye and of hand is necessary. Underneath the machine is a piece of woollen cloth brushing over the plate beneath for cleansing purposes. Simple as it is this contrivance has been the means of saving many lives, formerly sacrificed when the work had to be done by boys. The largest mill in Lancashire contains 112,000 spindles.

Warp and weft yarns are spun by these mules—the warp having a harder twist given to it than the weft. In each thread wound upon the cop we see the combined result of 1,728 of the filmy ribbons which came from the carding engine. Supposing the count to have been 60's, the pound of yarn

Council, a meeting together for consultation, and also a body of persons so meeting. There are almost as many councils, therefore, as there are human interests that need mutual consultation. A special use of the word is to denote ecclesiastical

consultations, which may be diocesan, provincial, national, general, or œcumenical. Those only which were general or œcumenical are of permanent importance, the difference between them being that those only whose decisions have met with universal acceptance are called œcumenical. While the English Church only allows the first four general councils to be of binding authority, the Greek Church admits seven, from the 1st of Nicæa in 325 to the 7th of Nicæa in 787, and the Roman Church regards as authoritative, in addition to these, the five Lateran councils, the Council of Trent (1545-1563), and the Vatican Council which met at Rome in 1869, and whose session is not yet terminated. To be made a member of the Sovereign's Privy Council is one of the highest honours an English subject can receive, though in the majority of cases the appointment is only complimentary, since few are called upon to take part in deliberation.

Council Bluffs, a city of Iowa, the capital of Pottawattamie county, lies some three miles east of the Missouri river, and 317 miles west of Davenport. The chief manufactures are carriages, paper, iron, and agricultural implements. It is an important railway station, two lines from Chicago converging here to meet the Union Pacific railway at Omaha, on the opposite side of the Missouri.

Council of War, a council of subordinate officers summoned by a military or naval commander, to aid him with their advice on occasions of such importance or emergency as seem to him to call for the opinions of others to supplement the conclusions of his own judgment. The opinions of such councils are in no way binding upon the leader who summons them, nor do they free him from the weight of his own responsibility.

Counsel. [BARRISTER.]

Count (from Latin *comes*, companion) originally meant one associated in government with a superior. Under Constantine, and in the Lower Empire generally, the *comites* formed a kind of council of state, and the dignity might carry real power or be, as in most cases it was, merely complimentary. The *comites* of the early German kings are primarily their immediate associates in war, on whom they confer honours, wealth, and special privileges. Under the Frank kings the Count of the Palace ranked next to the Mayor of the Palace, and Counts Palatine had in their own jurisdiction many royal prerogatives till a comparatively late period. We have still a County Palatine in England, and it was not till last century that Durham lost its Bishop Palatine. Though the title of Count never took root in England, the earl's wife is called countess. The German *graf* is more equivalent to our earl, but there was a higher degree of grafdom which enjoyed many privileges, and whose members later received the title of prince. There are still counts of the Holy Roman Empire, who receive their rank from the Pope.

Counterbalance, in *Engineering*, a weight employed to counteract the effects of vibrating or eccentric parts of a machine.

Counter-irritants, substances which produce irritation, and which are applied to the skin or other accessible parts, with the object of affecting deep-lying and inaccessible structures. For example, a poultice or blister is applied to the chest to relieve inflammation of the lungs or pericardium. Counter-irritation may act partly by drawing blood to the surface and so relieving congestion in the inflamed part, but probably its effect is mainly brought about through the nervous system. [BLISTER.]

Counter-point, in *Music*, the art of adding to a melody one or more separate melodies, distinct in themselves from the original theme, but combining harmoniously with it. The rules of counterpoint are not so strictly observed in the present day as they used to be in the 16th century; but a knowledge of the art is, nevertheless, essential for every kind of polyphonic composition, and has been brought to great perfection by Mozart, Beethoven, and Wagner.

Countersinking means the letting-in of a screw-head or bolt-head so that it shall be flush with the surface to which it is fixed.

County, in England the equivalent of the old English *shire*—a division of the country for purposes of judicial and local government, and ranking next above the hundred, but often in modern times subdivided for parliamentary and other purposes. Of old the earl was the head of the county in many respects, while the Crown was represented by the sheriff, who presided at the shire moot. At present the principal county officers are eight in kind—Lord Lieutenant, Custos Rotulorum, Sheriff, Coroner, Justices of the Peace, Clerk of the Peace, County Treasurer, County Surveyor; and the earldom is quite dissociated from the idea of county government. Under an Act of 1888 County Councils have been formed for the local government of sixty administrative counties. There are special county rates, County Boroughs which are exempt from the Council's authority, and County Courts for small civil cases.

County Councils, the elective bodies established by the Local Government Act 1888 to manage certain specified administrative business of each county formerly managed by the Justices of the Peace (who are nominated by the Crown), in Quarter Sessions and other administrative business mentioned in the Act, and consisting of the chairman, aldermen, and councillors. The councillors are elected for separate electoral divisions under the "County Electors Act, 1888," the qualifications for electors being similar to that of burgesses in boroughs, with the addition that ministers of religion are not disqualified and that peers owning property in the county and persons registered as parliamentary voters in respect of the ownership of property in the county are qualified. They are elected for three years, and then retire together. The aldermen, who are termed "County Aldermen," are elected by the councillors. They are elected for six years, and half of the number retires every three years. The chairman is analogous to the

its "Camp d'état," a place of confinement for political prisoners. The "Camp d'œil," a stage of unexpected discovery by its

Courbevoie, a town of France, on the Seine, in the department of the Seine, $5\frac{1}{2}$ miles N.W. of Paris, on the Paris and Versailles railway, contains several fine public and private buildings, and has a growing population.

Courier (Lat. *currere*, to run), literally a runner or messenger. In this sense the messengers of the Foreign Office who take dispatches and the like to a foreign court or to representatives abroad are called couriers; but the name is more generally used to denote skilled attendants employed by travellers to lessen the embarrassment of travel by their knowledge of the language of the countries travelled through, and by their experience of the measures necessary for the travellers' comfort.

Courier, PAUL LOUIS, French author and soldier, was born at Paris in 1772. He obtained a commission in the army, and served with distinction, but retired after being wounded at the battle of Wagram in 1809. A strong Republican, his political pamphlets of a very virulent character, directed against the Government of Louis XVIII., brought him into trouble in 1821, when, for a publication entitled *Le Simple Discours*, he was fined and imprisoned. He was assassinated in 1825. He is now chiefly remembered for his admirable prose style.

Courlan, the popular name of either of the two species of heron-like wading birds of the Neotropical genus *Aramus* (*A. giganteus* and *A. scolopaceus*). They were formerly classed with the Rails, but now constitute a family (*Aramidæ*).

Courland or **Kurland**, a government of Russia, capital Mittau, one of the Baltic provinces. It occupies an area of 10,535 square miles, and is bounded on the W. by the Baltic, on the N. by the Gulf of Riga, and on the N.E. by the river Dwina. The coast is flat and the surface undulating, with numerous lakes and marshes. Agriculture is the chief pursuit. Courland was incorporated with Russia in 1795. The original inhabitants of Courland were the Kûrs, a Finnish people akin to the Esthonians, but now extinct or absorbed in the surrounding populations. They are not to be confounded with the Kûrs (Kuren) who still occupy the shores of the *Kurische Nehrung*, but who are Aryans speaking a Lithuanian dialect. At present the great bulk of the people are Letts, also a branch of the Lithuanian family, numbering about half a million. The other elements are Russians (50,000), Germans (60,000), Jews (30,000), Poles (12,000), Livonians, Gypsies, and sundries (10,000).

Course. In navigation, the point of the compass on which a ship should be kept steering, or the angle which a ship's track makes with the meridian. The principal sails, *i.e.* the mainsail, fore-sail, mizzen, and sometimes also the mizzen-staysail, fore-staysail, and (in brigs and schooners) the main-staysails of a ship are usually distinguished as "courses."

Coursing as now understood is the hunting of hares by a brace of greyhounds. The sport may be carried on in open country, which seems the truer kind of sport, or in an enclosed space, where, although the performance of the greyhounds may be easily judged, the quarry gets no chance of escape, and so the charge of unsportsmanlike

practice may be urged as it is in the case of battue shooting. It is more particularly against this form of coursing that an outcry upon the score of cruelty has of late been raised. The judge at a coursing meeting has many points by which to decide the merits of the greyhound, the general principle being that not necessarily the dog that kills the hare is the winner, but the dog whose efforts most evidently lead to its being killed. The most noted meeting of the year is that in which the Waterloo Cup is competed for at Altcar in Lancashire. Open meetings often take place upon downs, though Plumpton, which is on the South Downs, has the doubtful honour of having inaugurated closed meetings. Kempton Park, and Wye, near Ashford, in Kent, have also noted meetings.

Court, an enclosed place, used metaphorically in many senses, for example a court of law, a court of honour, the court of a sovereign. To be presented at Court is to be presented to the sovereign on some ceremonial occasion such as a levee or a drawing room. It is a privilege which has much value for some people, and, as it confers certain rights, it is not lightly granted, and may be cancelled, so far as the rights pertaining to it are concerned. It is probably from association with the idea of a royal Court and the manners and customs which characterise it, that has come the verb *to court*.

Court Martial, NAVAL, a court composed of admirals, captains, and commanders for the trial of offences against the Articles of War, as prescribed by various Acts beginning with one of the 22nd of George II. Such courts are held in the forenoon and are public; and post-captains of all ships present in company have a right to assist. The sentence, unless it be a capital one, requires no confirmation, but the Lords of the Admiralty can suspend, modify, or annul it.

Court of Criminal Appeal. [APPEAL.]

Court of Sessions. [SESSION, COURTS OF.]

Courtney, LEONARD HENRY, LORD PENWITH, statesman, was born at Penzance in 1832, and educated at Cambridge. He was second wrangler and first Smith's prizeman, and in 1858 was called to the bar, and elected to the chair of Political Economy at University College, London, in 1872. In 1876 he was returned as Liberal member for Liskeard, became Under-Secretary of State in 1880, Under-Secretary for the Colonies in 1881, and Financial Secretary to the Treasury in 1882, and in 1885 was returned for the south-east division of Cornwall. He was chairman of committees in the Parliaments of 1885 and 1886. He was strongly opposed to the South African War (1899-1902), and retired from Parliament at the General Election in 1900. He was raised to the peerage in 1906.

Courtrai, a fortified town of Belgium in West Flanders, on the Lys, 26 miles south-west of Ghent. It possesses numerous fine public buildings, including a famous belfry. Its manufactures consist

With the outbreak of the American Revolution, the theatre was closed for a year. When it reopened, it was under the management of the actor John Philipps, who had been a member of the company. The theatre was a success, and Philipps was a popular actor. He was a member of the company from 1791 to 1795, and was a leading actor in the company. He was a member of the company from 1791 to 1795, and was a leading actor in the company. He was a member of the company from 1791 to 1795, and was a leading actor in the company.

Coventry, a midland city and county, parliamentary and municipal borough, and market town of Warwickshire, on the Sherbourne, a tributary of

the Avon, 18 miles S.E. Birmingham, and 94 N.W. London. The town is in part ancient, and has some good old timber-fronted houses. There are some fine public buildings, among them St. Michael's church—said to be the largest parish church in England—with a spire 300 feet high, Trinity church with a spire of 237 feet, and St. Mary's fourteenth-century hall, notable for its ornamental work, its carved oak roof, its tapestry, and fine painted window. There is a free public library, and the cemetery is one of the most beautiful in England. Owing to its central position Coventry is well placed for commerce, and besides its railway communication it is well served by canals, the Coventry canal joining the Oxford canal. The principal industries are cotton, woollen, worsted, and art-metal work, with silk dyeing, while its ribbons and watches are widely renowned, and of late years it has become the chief seat for the manufacture of bicycles and tricycles. Till the Restoration the city had walls, but these were destroyed in Charles II.'s time as a punishment to Coventry for having sided against the king in the Civil war. There are ruins of a Benedictine priory founded (1043) by Earl Leofric and the Lady Godiva, the name of the latter being also kept alive by the procession which perpetuates the memory of her gaining freedom from taxation for the town-folk by riding naked through the streets in the manner and under the conditions described by Tennyson in a well-known poem. Here, too, took place the trial by wager of battle between the Dukes of Hereford and Norfolk in the reign of Richard II. Mary Stuart was for a time imprisoned here. There is a statue of Starley, the introducer of the modern bicycle. The parliamentary borough returns one member. (Population 1901, 69,877.)

Coventry, SIR JOHN (1640–1682), was a member of the Long Parliament. Taking part with the Royalists, and sharing in their vicissitudes, he was made a Knight of the Bath in 1660. In 1667 he was returned to Parliament by the borough of Weymouth, and managed to offend the Court party by his proceedings in Parliament. Some ruffians of this party waylaid him and slit his nose, and in consequence Parliament passed in 1670 an Act directed against the offence of cutting and maiming, generally known as the Coventry Act.

Coverdale, MILES (1488–1568), an English bishop, widely known as a translator of the Bible into English. Born in Yorkshire, he was educated at Norwich and at Cambridge, and joined the Augustinian Order of Friars, being ordained priest. He was one of the first to become a Protestant, and, possibly owing to the danger he was consequently exposed to, he went abroad. In 1535 he made a translation of the Bible, his version of the Psalms, which is of far greater beauty as English than that of the Authorised Version, being still used in the Book of Common Prayer. In 1538 he went to Paris, apparently with the view of publishing his translation, but the Inquisition seized and destroyed the work. But he had a share in the "Great Bible," which was published in England in 1539. In 1540 he again went abroad, but in 1547

he was in England, and in 1551 was appointed to the see of Exeter. In Mary's reign he was imprisoned, but escaped with his life, and went into exile first to Denmark, and then to Geneva, where he took part in the Geneva translation. He came back to England, but was not reappointed to his bishopric. He, however, became the rector of St. Magnus's church in London, which living he resigned in 1566, and spent the remaining years of his life in retirement, giving up his time to literary pursuits and the study of botany. He was buried in 1569 in the church of St. Bartholomew, whence, upon the destruction of the church in 1840, his bones were removed to St. Magnus's church.

Covilhão, a Portuguese town in the province of Lower Beira, on a small tributary of the Tagus, near the Sierra da Estrella, 30 miles N. of Castello Branco, and 15 miles S.W. of Guarda. A brown linen is manufactured in the town, as well as woollen goods and hats. In the neighbourhood are hot sulphurous springs. Pedro de Covilhão, who travelled in 1490 to India and Abyssinia, was born here.

Covington, a town of the United States of America, in Kentucky, at the junction of the Ohio and the Licking, opposite Cincinnati, of which it is almost a suburb, being joined to it by a fine bridge. The manufactures are cotton, iron, distillery, glass, nails, and tobacco.

Cow. [CATTLE.]

Cow Bird, **COW BLACKBIRD** (*Molothrus pecoris*), the best known species of *Molothrus*, a parasitic genus of Hang-nests, ranging from La Plata to the North of the United States. Length about seven inches, plumage mostly black, with metallic lustre in the male, olive-brown in the female. The name refers to their habit of keeping near cows, and "finding from their parasitic insects or their droppings opportunities for food." [CUCKOO.]

Cowcatcher, a wedge-shaped projection fastened in front of a railway locomotive in order to thrust aside any impediment which may obstruct the line. It is used chiefly in unenclosed country where cattle and other animals are likely to stray upon the line. It is largely if not universally used in America, where it does duty also at times as a snow plough.

Cowell, EDWARD BYLES, an English Sanscrit scholar, born in 1826 at Ipswich, and educated at the grammar school there. He went to Magdalen Hall, Oxford, and was appointed Professor at Calcutta. In 1867 he was appointed Professor of Sanscrit at Cambridge, and in 1874 became Fellow of Corpus Christi College. He died in 1903.

Cowen, FREDERICK HYMEN, a musical composer, born in 1852 in Jamaica. He has composed the operas *Pauline* and *Thorgrim*, cantatas, symphonies, overtures, piano-pieces and numerous songs.

Cowes, EAST and WEST, two towns, one on each side of the river Medina, in the Isle of Wight, co. Hants, almost opposite Southampton Water, and about equidistant from Portsmouth,

Southampton, and Ryde, between each of which places and Cowes there is regular communication by steamer, while a steam ferry over the Medina estuary—here 600 yards wide—unites the east and west towns. The towns seem to have had their origin in two forts erected here by Henry VIII. in 1640 for the defence of the Medina. Of these the West Castle is now the Club-house of the Royal Yacht Squadron, which has its headquarters here. Besides the yachting which enlivens Cowes in the summer and employs many of the population, there is some shipbuilding. Osborne House, East Castle, and Norris Castle are in the neighbourhood. (Population 1901, 8,654.)

Cowley, ABRAHAM, an English poet (1618-1667), contemporary of Milton, whose fame he eclipsed in his own day, though now he is almost neglected. He was born in the City of London, and first had his poetic instincts roused by finding among his mother's books and reading Spenser's *Faery Queen*. At 10 years old he wrote a poem, *Pyramus and Thisbe*, and in 1630 *Constantia and Philetus*. He then went to Westminster school, and wrote an elegy on the death of Dudley, Lord Carlton. At 16 he produced *Love's Riddle*; and in 1636 he proceeded to Trinity College, Cambridge, where he wrote the *Epic of King David*, a work to which Milton is said to have been under obligation. He took the Royalist side in the Civil war, and went to Oxford, where he enjoyed the friendship of Falkland. After the battle of Marston Moor he went into exile, and did the royal family much service by conducting a cipher correspondence between Charles I. and the Queen Henrietta Maria. He travelled in France and Italy, but still devoted much of his time to his studies. In 1656 he was in England, and in 1657 he came home. He published a collection of poems, among them his *Pindaric Odes*, and in 1663 he published his *Cutter of Colchester*. He spent the latter part of his life in a voluntary retirement at Chertsey, near Westminster Abbey.

Cowley, CHARLES, an English diplomatist, son of the first Lord Cowley, and brother of the first Duke of Devonshire. He was educated at Eton, and afterwards at Christ Church, Oxford, and then at the University of Padua, where he was in 1681. He was in France in 1682, and in 1683 he was in the Congress of Rastatt, where he was in the treaty of Rastatt in 1687.

Cowper, WILLIAM, an English poet (1731-1800), was the second son of William Cowper, Esq., of the County of Devon. He was born on the 23rd of January, 1731. His father was a member of the House of Commons, and after the death of his father he was made first Lord of the Treasury. His mother, Anne, settled in the country, and he was left to her care. He was educated at the school of St. Andrew's, and afterwards in the University of Oxford.

lines, *On the Receipt of my Mother's Picture*. After her death, he was sent to a school at Market Street, where he suffered much from the tyranny of the elder boys. His eyesight becoming endangered, he went to live with an oculist, whom he left at the age of ten, in order to enter Westminster school. Here he was happy and studious, gaining the classical knowledge which in later life enabled him to translate Homer. At eighteen he was articled to a solicitor, in whose house he lived for three years. At the end of this period he took chambers in the Temple, where he resided until he was thirty-three. He was called to the bar in 1754, but devoted himself to the study of literature. Always prone to sadness, and obliged, in the first part of his residence at the Temple, to seek a cure for depression in change of scene, he early experienced real sorrow in the death of his friend, Sir W. Russell, and in the separation from his cousin, Theodora Cowper, with whom he was in love. Loss deepened the sense under which he laboured all his life that he was "cast forth a wanderer in a world unknown." In 1763 he was made Clerk of the Journals in the House of Lords, but was so filled with terror at the prospect of having to appear at the bar of the House, that his melancholy, already deep, increased into positive insanity.

He made three attempts to commit suicide, and was then placed at St. Albans, under Dr. Cotton, a physician who worked his cure, and substituted cheerful views of religion for the terrors from which he suffered. Upon his recovery he settled in Huntingdon in 1765, where he soon became an inmate of the house of Mr. Unwin, an elderly clergyman, who met with a fatal accident two years later. After this event, Cowper removed with Mrs. Unwin to Olney, attracted thither by Mr. John Newton, a man of much power, who was curate of that place. With this friend he wrote the *Olney Hymns*, which were published in 1779. Their composition had extended over several years, marked by an engagement to Mrs. Unwin, which was prevented from becoming a marriage by a long mental attack which prostrated Cowper in 1773. The plan of marriage was never renewed, but the poet and the widow continued to live together, and to her ministrations he owed many years of tranquil, though broken, happiness. He spent much of his time in his garden or his greenhouse, among his myrtles and his mignonette, amusing himself with his kittens, his hares, and his correspondence. The picture given in his letters is that of the life of a country gentleman of deep piety, with literary tastes, and much quiet humour and common sense. They are filled with genial gossip on local affairs or politics, or with remarks on literature, in which Cowper showed a love for simplicity, and an appreciation for Milton, that marked his originality in a generation whose taste was guided by Dr. Johnson. Much of his time and sympathy was given to the lace-makers of Olney, who knew him as "the Squire," or "Sir Cowper."

In 1781 Cowper anonymously published a poem, *Antithelyphthora*, in answer to *Thelyphthora*, a work by his cousin Madan, chaplain of the Lock

Hospital, designed to prove that polygamy as permitted in the Old Testament was intended to be a permanent institution. In the following year he brought out a volume containing *Table Talk, The Progress of Error, Truth, Expostulation, Hope, Charity, Conversation, Retirement*, and some shorter poems. In the same year he wrote *John Gilpin* in consequence of a story told him by Lady Austen. It was published anonymously and had a great success. At the suggestion of the same lady he wrote *The Task*, which with *An Epistle to John Hill, Tirolecinium*, and the now acknowledged *John Gilpin*, was brought out in 1785.

No sooner was *Tirolecinium* finished than Cowper set himself to the most laborious task of his life, the translation of Homer. At that time Pope's translation was generally thought to be unsurpassable, but Cowper's critical taste led him to agree with "the *literati*," who, he said, had settled that, "although Pope has given us two pretty poems under Homer's titles, there is not to be found in them the least portion of Homer's spirit, nor the least resemblance of his manner." In particular he found fault with the vehicle of rhyme, and adopted blank verse as his own medium of translation. Owing to fresh mental trouble the book was not ready for publication until 1791.

In the same year Mrs. Unwin had an attack of paralysis, and gradually from that time gloom deepened round Cowper, broken only by a visit to the poet Hayley in Sussex in 1792, when Romney painted his portrait. He had by this time already fallen under the influence of a schoolmaster at Olney named Teedon, who undertook to interpret spiritual voices which spoke to the disordered poet. Material prosperity came towards the close of his life. He had hitherto lived on the charity of his relations, but his Homer brought him £1,000, and in 1794 he received a pension of £300 from the king. He was, however, already incapable of managing his own affairs. In the following year his cousin Johnson removed him and Mrs. Unwin from Weston Underwood, a village near Olney in which they had been living for the last nine years, to his home at East Dereham, where Mrs. Unwin died in 1796. Cowper lingered miserably until the 25th of April, 1800, when he passed away. His last original work was *The Castaway*. After his death were published *Translations from the French of Madame de la Motte Guyon*, and some translations of the Latin and Italian poems of Milton.

As a writer, Cowper may claim to have taken a permanent place. His deep religious feeling, his veins of irony and humour, his mastery of a style, clear and simple, and flexible enough to pass at will from light badinage to real solemnity, rank him high among the poets of the eighteenth century, and in many respects apart from them. In his love for nature, and his interpretation of its teaching in the light of faith, he has frequently been considered the forerunner of Wordsworth. The real charm of the man, perhaps, is most felt in his letters, which unfold in the most winning way the whole drama of his chequered life. No English man of letters has left, in matter or in style, a more beautiful or more touching autobiography.

Cowpox. [VACCINATION.]

Cowries, a group of Gastropoda (q.v.) belonging to the family Cypræidæ, and the genus Cypræa. They are carnivorous in habit, and have an oval shell; the mantle extends back as two lobes, and as these deposit shell, the spire is concealed in the adult by a covering of smooth, polished, porcellaneous material. The lip becomes much thickened and the mouth contracted when the animal becomes adult; this gave rise to the old idea that the animal abandoned its shell and formed a new one at successive periods. There are about 150 species known, most of which come from tropical seas; only the small *Triva europæa* occurs on the English coasts; this species ranges from Norway to the Mediterranean, and is found fossil in the Crag. Many of the tropical species are larger, and others are well-known owing to their use as currency. *Cypræa tigris* is one of the largest and most handsome, and is frequently used for cameo cuttings. *Cypræa princeps* is one of the most valuable owing to its excessive rareness, as much as £40 having been paid for a single specimen. The species used for currency are smaller and very abundant. The one most frequently employed is the Indian *Aricia moneta*; in India between 3,000 and 4,000 go to a rupee, while in Siam over 6,000 are worth a tical (1s. 6d.). In Africa their value is higher, and they are used in strings of 100 in each; a string is worth about 2½d. The earliest Cowries occur in the Cretaceous rocks of India.

Cowslip, the popular name of *Primula veris*, also in some districts known as *paigle*, one of our favourite spring flowers. It grows throughout Europe and Western Asia, occurring at an elevation of 1,600 feet in Northumberland, often stunted on poor limestone uplands and flourishing on chalk or in stiff clay pastures. It has radical rosettes of obovate leaves with winged petioles, and erect peduncles surmounted by an umbel of short-stalked pendulous flowers. The limb of the yellow corolla is cup-shaped, and bears five orange spots at the throat, as alluded to by Shakespeare in *Cymbeline*. From the fragrant flowers a wine is prepared.

Cox, DAVID (1783-1859), an English landscape painter, at first in water colours and later in oils. He was born at Birmingham, and was in early life employed in his father's forge. Leaving this work, he became a theatrical scene-painter, finding in that calling valuable experience and practice. As a water-colour painter he almost marks an epoch, being specially English in his subjects and treatment. Almost his farthest visit afield for subjects was Bettws-y-Coed, a place he was very fond of and constantly visited. After his marriage he went to Dulwich, where he gave lessons in drawing and painting. He considered himself lucky to get an appointment of £100 a year in a ladies' school at Hereford, where he supplemented his income by lessons at the grammar school. Latterly he retired to Birmingham, where he lived in a suburb. His works are very numerous, though he destroyed many of them, and though they did not fetch a great price in his lifetime, their value

is going up. His ambition was to sell a picture for £100; now some have fetched upwards of £3,000.

Cox, SIR GEORGE, an English writer, born 1827. He was educated at Rugby and Trinity College, Oxford, and took orders in 1850. He succeeded to the baronetcy in 1877. He is best known as an advocate of the "solar theory" of the interpretation of mythology, on which he has written numerous works, as also a History of Greece and a *Life of Bishop Colenso*. On the death of that prelate he was elected his successor by the Synod of Natal; but, there being a rival Anglican bishop in the colony, the Crown refused to confirm the appointment. He died in 1902.

Coxe, HENRY OCTAVIUS (1811-1881), an English man of letters, to whom Dean Burgon has given a place in his *Lives of Twelve Good Men*. Born at Bucklebury, Berkshire, he was educated at Westminster, and at Worcester College, Oxford. In 1833 he received an appointment at the British Museum, and at the Bodleian Library, Oxford, in 1838, becoming head librarian in 1860. He did not publish much original matter, though he did good service to literature by editing catalogues of MSS. in the colleges and halls of Oxford and the Bodleian Library. He also travelled in the East, and discovered valuable Codices.

Coyapos, a large Brazilian nation, formerly widespread throughout Goyas and the conterminous provinces of São Paulo and Matto Grosso. They belong to the Tupi family, of which they are one of the chief branches. The Coyapos, now mostly civilised, are described by Dr. Kupfer in *Zeitschrift für Ethnologie*, p. 222, Berlin 1870.

Coyote (*Canis latrans*), a Wolf, ranging from Mexico to the Pacific Ocean. It is about the size of a pointer dog, and is much more common on the back, and bushy parts of the country than the Wolf (q.v.).

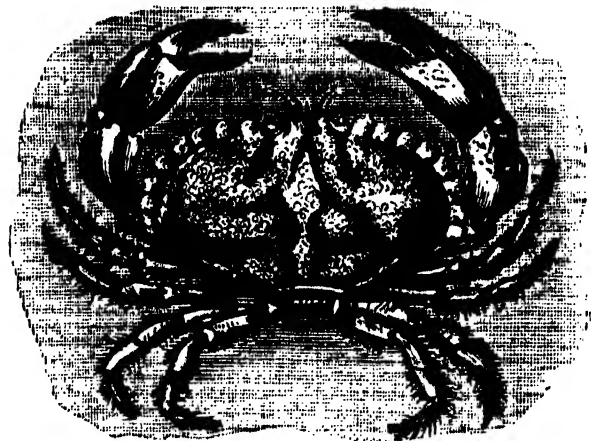
Coypu (*Myotis*), a large South American rodent, of the genus *Myotis*. These animals are found in the mountains and rivers, and, it is said, are good swimmers. They are occasionally on the ground, and their tail which is long and bushy is excellent for climbing. The flesh is sold in the markets of Lima.

Coyne, a name of Irish origin, and is a name of Peter the painter, and of other things, but the reason in which they are mentioned is their appreciation of them in the art of painting.

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and as this latter is simpler and more convenient for dissection, it is taken as the type of the order. The crab that is mostly used as food in England is known as *Cancer pagurus*; the commoner Shore Crab (*Carcinus mænas*) is also largely used. If a specimen of either be compared with a Crayfish, it will be seen that the larger anterior plate (cephalothorax) covers the whole of the upper or dorsal surface of the body, whereas in the Crayfish it occupies only the front half, while behind it occurs a long jointed abdomen or "tail." The plate, moreover, is broad in the Crab, and narrow and long



CRAB.

in the Crayfish. The eyes are placed on stalks (peduncles) on the anterior margin, and look upward and forward instead of sideways. The abdomen in the Crab is much reduced in size, and is bent up under the main mass of the body (or thorax). The appendages are constructed on much the same plan as in the Crayfish, but those on the abdomen are rudimentary. The general anatomy of the soft parts agrees with that of the Crayfish, though in the Crab they are more closely packed together owing to its broader and shorter shape. This is notably the case with the nervous system in which the ganglia, except the first two pairs, are closely collected together into one group, instead of extending as a long chain of ganglia as in the Crayfish. The hard outer skin or shell of the crabs is not capable of growth, and is therefore periodically thrown off to allow of the expansion of the animal; this is known as "ecdysis," and before the new coat has again become hard the crabs are known as "soft crabs." The crabs are mainly inhabitants of the sea, and breathe by branchiæ or gills; but there are several genera of Land Crabs, such as *Gecarcinus* or the Calling Crabs (*Gelasimus*), in which air is admitted directly into the branchial chamber where it aerates the branchiæ. The development of the crabs shows that they are a more specialised group than the Long-tailed Decapoda (*Inacrura*), such as the Lobster; for in most cases the young pass through a "Zoea" stage in which they have a long, narrow six-jointed abdomen resembling that of the Lobsters, etc. In some of the Land Crabs, such as *Gecarcinus*, the development is direct, i.e. there is no metamorphosis. As regards geological distribution, the crabs make their first appearance in England in the Oolite rocks with the *Palæinachus longipes* (H. Woodw.) of the Forest

Marble. They are fairly abundant in the Tertiary rocks, and considerable numbers may be found in the London Clay of Sheppey; these belong especially to the genera *Xanthopsis*, *Plagionotus*, etc. Of recent crabs the small Pea Crabs (*Pinothères*), the large *Inachus* of Japan which measures ten feet between the tips of the great claws, and the burrowing Racer Crab of Ceylon (*Ocypoda*) are among the more interesting forms. The "Hermit Crabs" belong to the Inacrura (sub-order Anomura), and are not, therefore, included here.

Crab, ROGER (1621 - 1680), an eccentric Englishman who became a hermit and tried to carry out literally some of the precepts of the Gospel. For instance, after seven years' service in the Parliamentary army, he set up in business, but in a year or two sold all he had and gave the price realised to the poor. He retired to a solitary hut, and led a strictly vegetarian life, his only drink being water. He was persecuted by his neighbours for his eccentricities, and by the authorities for breaking the laws. He wrote *The English Hermit*, *Dagon's Downfall*, and a tract against the Quakers.

Crabbe, GEORGE (1754-1832), an English poet who has been described as the poet of East Anglia, since his poems are vivid exponents of East Anglian life and manners. Born at Aldborough in Suffolk, he was apprenticed to an apothecary with a view to becoming a doctor. He soon showed poetical tastes, and, having gained a prize for a poem on Hope, he gave up the idea of medicine, and came to London to starve upon literature. At the moment when he was in the greatest straits he applied to Burke, who took him in hand, and introduced him to Reynolds, Johnson, and Fox, and to the publisher Dodsley. He visited Burke at Beaconsfield, and it was there that he composed *The Village*, which with *The Library* he published after making the acquaintance of Burke. In 1781 he was ordained, and after being for a short time curate of Aldborough, he was appointed, through Burke's influence, domestic chaplain to the Duke of Rutland, and rector of Frome St. Quintin, Dorset, and soon after obtained such preferment as made him a considerable pluralist. He married the love of his youth, and in 1813 he was presented to the rectory of Trowbridge, Wilts, where he spent the remaining years of his life. *The Newspaper* (1785) was followed by a long cessation from publication, but in 1809 he published *The Parish Register*, in 1810 *The Borough*, and in 1812 *Tales in Verse*, his last work appearing in 1819, *Tales of the Hall*. He produced very little prose, a natural history of the Vale of Belvoir, written for *Nicholl's History of Leicestershire*, being, perhaps, the best known of his prose writings. As a poet he is distinguished by originality, and a stern realism which presents the naked truth not always in the most pleasing form. He is a morbid anatomist of nature, and is often-times tediously minute, while his style is sometimes harsh, and his taste frequently defective.

Cracow, a town of Austria, situated at the junction of the Rudawa and the Vistula, on a plain in an amphitheatre of hills. The town is the

seat of a Catholic bishopric and of a university. Among the industries are the manufacture of paper, pottery, tobacco, wool, leather, spirits, and beer. Cracow presents a fine view from the outside, but the streets are narrow and dirty. Of the forty churches, the most notable are St. Michael's (890), and St. Wenceslas's cathedral, begun in 1000 A.D. The gate of St. Florian (1498) is a good specimen of Gothic architecture. The Royal Castle (700) is now a barracks and hospital. The bishop's palace (992), which was damaged by fire in 1850, contains paintings by Michael Stachovitz, the subjects being drawn from Polish history. There is a linen hall which will hold 6,000 people. A large square occupies the centre of the town, and outside are fine limes, chestnuts, and poplars. Before the Christian era there was a Slavonic city called Waweb, whose name is given to one of the hills in the neighbourhood. In 700, Krakus and his daughter Wanda did much for the city, which, by reason of its central position, became the second capital of Poland. After a Tartar attack in 1241, it attained, under Sigismund II. (1506-1548), a position of splendour and importance. In 1544 Protestant doctrines made their appearance, and an impetus was given to them by the dispersion of the students in 1549, as they brought back the new doctrines from Germany. The last king of Poland crowned at Cracow was Frederick Augustus III. (1734). From 1815-1846 a protected republic was established, but at the latter date Cracow became an Austrian grand duchy.

Crag, the East Anglian term for a shelly gravel or sand, now generally transferred by English geologists to the whole of the Pliocene system, which in the eastern counties is mainly represented by such rocks. This system represents the epoch when the continents were taking their present form and the climate of Northern Europe was gradually refrigerating to the cold of the Glacial Period (q.v.). It is only well represented in Europe in the basin of the Mediterranean, where several thousand feet of marine beds had accumulated before the first outbursts of Etna and Vesuvius. In England it is represented by some 100 to 150 feet of sandbanks deposited during a subsidence of the east coast, with patches at St. Erth in Cornwall, Lenham in Kent, and elsewhere. Of the numerous mollusks they contain at least 84 per cent. belong to living species. These beds may be subdivided as follows:—

7. Westleton and Mundesley Crag and Cromer Forest-Bed Group, 10-70 feet.
6. Chillesford Clay and Sand, each 8 feet thick.
5. Norwich, or Fluvio-marine, Crag, 5-10 feet.
4. Red Crag, 25 feet.
3. Lenham Beds.
2. St. Erth Beds.
1. White, Suffolk or "Coralline" Crag, 40-60 feet.

At the base of the series are beds of phosphatic nodules (q.v.) and fossils of cetaceans, sharks, mastodon, elephant, rhinoceros, etc., probably derived from the denudation of an earlier bed, possibly the "Black Crag" or glauconitic sands of

Antwerp, which has Miocene affinities. The Coralline Crag (q.v.) contains 5 per cent. of northern forms of Mollusca, the Red Crag 10 per cent., and the Norwich Crag 14 per cent. The numerous Polyzoa, *Terebratula grandis* and *Astarte Omalii* are specially characteristic of the Coralline Crag; *Trophon antiquum* var. *contraria*, the left-handed dog-whelk, of the ferruginous Red Crag; land and fresh-water shells with northern marine forms, *Elephas meridionalis*, *E. antiquus* and the giant beaver *Trogontherium*, of the Norwich Crag; *Mya truncata* and other northern marine shells, of the Chillesford Beds; and the Irish deer, *Cervus megaceros*, the Mammoth *Elephas primigenius*, with the species just named, and *Machairodus*, the sabre-toothed tiger, of the Forest-bed. This last series is estuarine and marine with peat and drifted firstumps and many plant-remains. It is only exposed under the Boulder Clay cliffs at low tide. The pre-glacial gravels at Westleton and Mundesley and elsewhere may be of the same age as the Forest-bed. The numerous mollusks of the St. Erth beds, about 60 per cent. being living species, indicate an age intermediate between the White and the Red Crag; whilst the Lenham sands filling pipes in the Chalk of the North Downs yield an assemblage perhaps even more closely related to the former, but still intermediate.

Craig, JOHN (1512-1600), a Scottish reformer, who, after an education at St. Andrews, became a Dominican, and was imprisoned on a charge of heresy. He went abroad, and for some time performed the ordinary duties of his order, but after a study of Calvin's Institutes he became a Protestant, and was condemned by the Inquisition. The death of the Pope saved his life, as the mob broke open the prison, and he fled to Vienna where Maximilian, the protestant emperor, received him. He returned to Edinburgh, and was associated with John Knox in his work, and was afterwards elected as leader of the Scottish Reformation. His works were *The King's Confession*, 1560, and *The Second Book of Discipline*.

Craig, Sir James (1673-1747), a Scottish jurist and politician, was educated at St. Andrews University in 1691, and afterwards studied the civil and canon law in the universities of Scotland and was called to the bar in 1700. In 1704 he was appointed Sheriff of the County of Edinburgh, and in 1705 he was appointed Lord of Session. He was a member of the House of Commons in 1713, and in 1714 he was appointed Lord of Session. He was a member of the House of Commons in 1713, and in 1714 he was appointed Lord of Session. He was a member of the House of Commons in 1713, and in 1714 he was appointed Lord of Session. He was a member of the House of Commons in 1713, and in 1714 he was appointed Lord of Session.

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sandstones of the Lower Carboniferous (q.v.), which have yielded much of the stone used for building in Edinburgh.

Craik, GEORGE LILLIE (1799-1866), a man of letters of the 19th century. Born in Fifeshire, he entered at St. Andrews, and at 25 years old came to London to enter on a literary life. His *Pursuit of Knowledge under Difficulties* was published in 1831, and from that time he was a diligent and voluminous writer. In 1849 he was appointed Professor of History and English Literature at Queen's College, Belfast, a post that he occupied till his death. Among his many works may be mentioned his *History of Literature and Learning in England, Spenser and his Poetry; Bacon: His Writings and his Philosophy*, and *The English of Shakespeare*.

Craik, MRS. (Miss Mulock) [1826-1887], an English novelist, best known as the author of *John Halifax, Gentleman*, a book whose charm has been universally appreciated, and has led to its being widely translated. Of her other novels the first (1849) was *The Ogilvies*, followed by *Olive, Head of the Family*, and *Agatha's Husband*. She has also written several other novels, articles in magazines, poems, and some volumes of essays, among them *A Woman's Thoughts About Women*. She married in 1865, and spent the rest of her life at Shortlands, in Kent.

Crake. [CORNCRAKE.]

Cramer, JOHANN BAPTIST (1771-1858), a pianist, born at Mannheim, in Germany, but brought up in England, where his father settled the year after his son's birth. He made a reputation in a series of Continental concert tours, and founded a musical publishing house in 1828. He lived for the latter part of his life, and died, in Paris.

Cramp, a term applied to involuntary contraction of muscle, accompanied by pain such as occurs in the calves of the legs after excessive exercise or during convalescence from acute disease. Cramp may involve the muscles of the trunk, it rarely invades those of the limbs, with the notable exception of the muscles of the calf of the leg. Varicose veins and gout seem to act as predisposing causes of cramp: again, muscular cramps are striking symptoms in the onset of certain acute diseases, notably cholera. In the treatment of cramp friction and forcible extension of the affected muscles opposing the spasm are the most effectual means of alleviating the distress occasioned by the seizure. The intractable forms of cramp met with in bedridden subjects are often alleviated by raising the head of the bed some six or eight inches. *Writers' cramp* or *scriveners' palsy* is a condition in which involuntary contraction of certain over-worked muscles is associated with pain, and with more or less paralysis. It affects, as the names given imply, clerks and others who are engaged during the greater part of each day in writing. The history of the condition, unfortunately, is usually one of steady progress from bad to worse. The right hand is finally rendered useless for

writing purposes. In some instances where the left hand has been employed by sufferers, in order to continue to earn a livelihood, it, too, has been attacked. Rest of the affected muscles is practically the only satisfactory form of treatment. Electricity is of service in some cases.

Cramp Ring, a ring worn as a preservative against cramp. In England such rings were solemnly consecrated by the king on Good Friday.

Cranach, LUCAS (1472-1553), a German painter, born at Kronach, in Franconia. Next to nothing is known of his birth and education, but he appears to have attracted attention before the end of the fifteenth century. In 1504 the Elector of Saxony gave him an appointment, and a picture of this date exists. For some years he practised many branches of his art, painting altar pieces, still life and game for house decoration, drawing on wood, engraving on copper plates, and designing dies for the mint. In 1500 he was appointed to make sketches of the Emperor Maximilian and the future Charles V. About this time the Duke gave him a printing monopoly, and also a monopoly of drugs in Wittenberg. Luther's Bibles were produced at his press. He was twice burgomaster of Wittenberg, but at a later period Wittenberg, with its prince and Cranach, fell upon evil times, the town being besieged and the prince captured, and Cranach accompanied him or joined him. He died at Weimar. His best painting is thought to be his *Rest of the Virgin* (1504), but his copperplates and woodcuts are his most representative productions. He painted many religious scenes and some mythological ones. But his chief work was portrait painting, and he painted most of the German reformers, notably Luther, and princes of the time. Portraits of Albert, Elector of Mainz, in the Berlin Museum, and of John, Elector of Saxony, in the Weimar Museum, are considered good specimens of his work.

Cranberry, the berry of the two species constituting the ericaceous genus *Oxycoccus*, probably so named from being eaten by cranes. They are slender creeping plants growing in bogs, with woody stems, small scattered evergreen leaves, drooping tetramerous flowers with rotate corollas, and crimson berries. The common cranberry, *O. palustris*, has ovate-oblong, cordate leaves, with revolute edges, and pear-shaped fruits. It is a native of Siberia, Northern Europe, and America, and is now imported from Russia, though formerly it was abundant in the fens of Lincoln and elsewhere. The large-fruited cranberry, *O. macrocarpus*, has flat, elliptic leaves and spherical berries, larger and brighter red than those of *O. palustris*. It occurs wild from Canada to Virginia, and is cultivated on poor land in New England, where an acre will yield from 80 to 100 bushels. Its fruit is largely imported into England for tarts. Cranberries are valuable antiscorbutics, and are used in Sweden to clean silver plate. The cranberry plant is the badge of the clan Grant.

Cranbrook, GATHORNE-HARDY, VISCOUNT, an English statesman, born 1814 at Bradford. He

was educated at Shrewsbury and Oriel College, graduated in 1837. He was called to the bar 1840, and entered Parliament for Leominster in 1856. In 1865 he won the seat for Oxford University against Mr. Gladstone. He first became a member of the Ministry in 1858, and filled several offices, the chief being Home Secretary (1867-8), Secretary for War (1874-8), Secretary for India (1878-80), and Lord President of the Council (1885-92). He was made a peer in 1878 and died in 1906.

Crane, a book name for any of the Gruidæ, a family of wading birds allied to the Storks and Herons, but having the hind toe placed higher than those in front. *Grus*, with twelve species, absent only from the Neotropical region, is the type-genus. The straight, strong bill is longer than the head; nostrils longitudinal in a furrow; windpipe convoluted, except in the Asiatic Crane (*G. leucogeranus*). Many species are migratory; and this habit was



CRANE.

known to classic writers, and is noticed by Jeremiah (viii. 7). All are noted for their grotesque antics or "dances" when excited. The Common Crane (*G. cinerea*) breeds in the northern parts of the Eastern hemisphere, migrating southwards in close wedge-like bodies in winter. It was formerly a native of English fen-lands, but is now a rare visitor. Its height, when erect, is about four feet; forehead, top of head, and neck, dark slaty ash; a broad line of greyish white extends down each side of the neck; the general body plumage is soft ash-grey; the primaries black; tertiaries, which can be raised or depressed, tipped with bluish black. These plumes were formerly in much request for ladies' head-dresses. Cranes feed on worms, insects, small reptiles, seeds, roots, etc.; and their flesh is valued for the table. [CROWNED CRANE, DEMOISELLE.]

Crane, in *Engineering*, is a machine much employed at docks, wharves, warehouses, and elsewhere, for raising and lowering various materials. Cranes may be worked by hand, steam, high-pressure water, or, a plan which has recently been adopted, by electromotors. The simplest form

consists essentially of a vertical pillar, a long oblique arm or *jib* springing from the base of the pillar, its upper extremity reaching to the maximum height required; and a lifting-chain passing from a drum on the crane-post over a pulley at the top of the jib, and bearing at its other extremity the load to be lifted. Rotation of the drum produces upward or downward motion of the load, and is effected by hand or machine. The crane admits of rotation about the vertical post, this motion being produced by auxiliary apparatus. A direct-acting steam-engine, with small vertical boiler attached, is frequently mounted on the carriage that supports the crane, and is adjusted in position so as to balance the load lifted. The necessary force to lift the load might be too great to be applied directly at the drum; so a smaller force is made to effect this by a combination of spur-gearing. The crane being mounted upon a carriage possesses the advantage of being able to carry a load from place to place, and lines of rails are frequently laid down to facilitate this. The jib is to stand compression, and should therefore be designed so as to resist buckling. It is frequently hollow, or, in heavier types, of lattice-girder pattern. Armstrong's hydraulic cranes employ water at a pressure of 700 lbs. to the square inch, and the power is multiplied by a system of pulleys. The foundations supporting heavy machines must be carefully and substantially built, loads of fifty to a hundred tons, such as are lifted by the heavier cranes, being sufficient to crush weak foundations.

Crane, THOMAS FREDERICK, an American literary man, born at New York, 1844. He graduated at the New Jersey university, and has successively filled the posts of professor of modern languages of the University of New York, and of the Romance languages of the University of Wisconsin. He is chiefly known for his studies in the study of folk-lore, and the collection of old languages, his best admired work being his *Italian Popular Tales*, and his edition of the *Œuvres* of Jacques de Vitre, Bishop of Limoges.

Crane, WALTER, an English painter, born at Liverpool 1845. He began his artistic career in 1862, and has been book-illustrator since 1862. His work was exhibited at the Royal Academy in 1888. He was appointed to the post of assistant secretary of the Society of Artists in 1888, and is now residing in London.

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small one, being only about $\frac{1}{4}$ inch in length, but it lives in large swarms. The largest known Crane Fly is a species from North China, which measures $4\frac{1}{2}$ inches across the wings.

Cranesbill, the English name for the genus *Geranium*, so called from the long beak of the fruit formed by a central prolongation of the axis (carpopore) in grooves in which lie the styles of the five carpels. The genus comprises about 100 species, mostly herbs, natives of temperate regions, especially sea-shores and sandy regions, about a dozen species being British. Their stems are swollen at the nodes, their leaves palmate in venation or lobings, and their flowers polysymmetric and pentamerous, with imbricate sepals, and ten stamens united at the base of their filaments. When ripe, the five carpels separate as indehiscent cocci [REGMA], the styles coiling elastically from the carpophore. The genus gives its name to the order *Geraniaceae*. [PELARGONIUM.]

Cranganore, a town on the Cochin river in the Cochin state, Southern India, eighteen miles N. of Cochin town. There was an early establishment of Christians here, and a Jewish settlement of early date, and St. Thomas the Apostle is said to have visited the town. It belonged for a time to the Portuguese, then to the Dutch, and then to Tippoo Sahib till 1789.

Craniata. [CHORDATA, VERTEBRATES.]

Craniidæ, a family of Brachiopoda, of which *Crania* is the type-genus. They are fixed by the flat ventral valve to rocks, echinoids, mollusca, etc. The upper or dorsal valve is limpet-shaped. The two valves are connected only by muscles. There is no hinge, so that the family belongs to the subclass Inarticulata. *Crania* was a common fossil in the Chalk. The family ranges from the Silurian upwards.

Cranium. [SKULL.]

Crank, in *Mechanics*, is a lever with one end grasping a rotating shaft, and the other end a connecting rod. Its usual purpose is to convert the alternating motion of the end of the connecting-rod into the rotating motion of the shaft. It is made generally of cast-iron, wrought iron, or of case-hardened steel. The connecting-rod grasps the crank by a cylindrical crank pin, which fits closely in a hollow cylindrical bearing or *bush* of softer metal, such as brass or gun metal. Such a lever is the single crank, which may be fitted on to the end of the shaft. If, however, the motion is to be given to a central portion of the shaft, a piece must be cut out of the latter, and a double crank fitted on, the general alternative being to fix on an eccentric (q.v.).

Cranmer, THOMAS (1489-1566), an English archbishop, born at Aslacton in Nottinghamshire, and educated at Jesus College, Cambridge, of which society he became fellow in 1510, vacating his fellowship soon after on account of marriage, but receiving it again upon the death of his wife before the expiry of the year of grace. In 1523 he

was ordained, and lectured in divinity in his college, and was examiner in divinity for the University. In 1528 an outbreak of the sweating sickness emptied Cambridge, and Cranmer with two pupils went to Waltham in Essex, where he met Gardiner and Fox who were in attendance upon Henry VIII., and pleased them and, through them, the king by his view that Henry could obtain a divorce from the ordinary ecclesiastical courts without the necessity of an appeal to Rome. The king employed him about the divorce question, made him archdeacon of Taunton, engaged him to write a treatise and to argue the question before the authorities of Oxford and Cambridge, and further sent him as a member of an embassy to Rome upon the subject. In 1531 the king appointed him ambassador to the German emperor, and in Germany Cranmer married again, and was still in that country when Henry in 1532 summoned him to the vacant see of Canterbury, an honour which Cranmer tried to avoid. The archbishop carried out the king's wishes and tried the question in his archiepiscopal court, giving judgment against Queen Catherine, and a week later he crowned the new Queen Anne Boleyn. The next three years he spent chiefly in the affairs of his diocese, and in advancing the doctrine of the king's supremacy in matters ecclesiastical as against that of the Pope. He was subservient to the king in the matter of annulling Anne Boleyn's marriage, as later he was in that of Anne of Cleves. His great work, however, was the advancement of the Reformation, though he had not the courage to oppose the "Six Articles." The *Homilies*, which appeared in 1547, are considered to be some of them his own handiwork. His *Defence of the True and Catholic Doctrine of the Sacrament* is considered to set forth the tenets of the old-fashioned English High Church. At Henry VIII.'s death Cranmer became under the king's will head of the Council of Regency. During the reign of Edward VI. the archbishop was diligent in producing the First and the Second Prayer-book. His siding with Lady Jane Grey's party, in spite of his promise to Henry VIII., brought upon him, quite apart from other causes, the enmity of the new court party. His committal to the Tower in 1553 was followed by his death by burning in 1566, his besetting sin of weakness causing him to make recantations and reassertion of his opinions up to the last. On the whole, he seems to have been a man of good intentions and kindly amiable disposition, but his weakness and vacillation made him a time-server and a coward.

Crannog, Crannoge, a kind of lake-dwelling (q.v.), formerly used in Scotland, but principally in Ireland. It was an artificial island, formed of a framework of piles and staves, filled up with brushwood and kept down by stones and gravel, on the top of which was a thick layer of earth. On this huts were erected, and, when surrounded by palisades, the structure served as a stronghold. Some existed in county Monaghan in the 16th century.

Crashaw, RICHARD (1613-1650), English poet, born in London and educated at Charterhouse

and Pembroke College, Cambridge, where he graduated in 1634. The year 1633 saw the publication of Herbert's *Temple*, and the next year Crashaw published his first work *Epigrammatum Sacrorum Liber*. In 1634 he became fellow of Peterhouse, and was ejected from his fellowship in 1644. Going to France, he became a Catholic and stayed in exile, his friend Cowley obtaining the influence of Queen Henrietta on his behalf. He went to Rome, and became secretary to Cardinal Palotta, in whose service he remained till 1649. While he was in exile, a collection of his secular and religious poems was published with the titles *The Delights of the Muses* and *Steps to the Temple*. In 1648 at Paris two Latin hymns were published. In 1652, after his death at Loretto, a collection called *Carmen Deo Nostro*, dedicated to the Countess of Denbigh, was brought out. Crashaw's poetry is not of a kind to commend itself to modern taste on account of its extravagant and fantastic images and expressions, but it contains fragments of great beauty. His mystic views and delicacy of character are visible in his works. Cowley's opinion of him is set forth in one of the prettiest elegies in our language.

Craspedota, a sub-class of the Hydrozoa (q.v.) including all those in which the medusa (or jelly-fish, q.v.) has the mouth constricted by a flat broad ring known as the velum. It includes three orders, the Hydroidea, Trachymedusæ, and Siphonophora. The first is the most important. Hydra (q.v.), the common fresh water polype, is its most typical member, but it also includes Cordylophora (q.v.), the Corynida (q.v.), the Hydrocorallina (q.v.), Campanularia, and the "Sea Firs." The Trachymedusæ develop directly by metamorphosis from a free Hydroid larva. The Siphonophora includes the Portuguese Man of War (*Physalia*), *Vellella*, and other less known types. All the Craspedota are marine except *Limnocoedium* (q.v.), a small form found in the *Victoria regia* tank at Kew, and one recently found in Tanganyika; this latter is an additional argument for the originally marine origin of those lakes.

Craspedote Medusæ. [CRASPEDOTA.]

Crassulaceæ, an order of Calycifloræ (q.v.) allied to the Saxifragaceæ (q.v.) and comprising some 400 to 500 species in 24 genera. They are characterised by their thick succulent leaves, being adapted to dry climates and situations, such as rocks, walls, and sandy plains, and are especially abundant in South Africa. Their flowers are in complex cymes, often dorsiventral, and are remarkably polysymmetric and pentamerous, having often five carpels as well as five sepals, five petals, and ten stamens. The fruit is a ring of follicles. Astringent roots, acrid foliage and emetic and purgative properties occur in the order. Though the genus *Crassula* is mainly African, some ten species of *Sedum*, the stonecrops, and single species of *Tillæa*, *Cotyledon* and *Sempervivum* are natives of Britain.

Crassus, MARCUS LICINIUS, a member of the famous first triumvirate with Cæsar and Pompey.

His wealth was great, and he increased it by judicious methods. In exile, on account of Cinna's proscription, he passed to Spain, and from there, at Cinna's death, he went to Africa and to Italy, and was received into favour by Sulla. He gained a decisive victory over Spartacus in 71, and was the next year made consul with Pompey, and made an ostentatious display of his wealth at his installation. As a triumvir he chose Syria as his province, and, having attacked Parthia, the Parthian general captured him and poured molten lead down his throat by way of indulging his love of riches, B.C. 53.

Crater, from the Greek *kratēr*, a bowl, the hollow formed by the explosive action, in the summit of a volcanic cone. Volcanic craters vary in size from the tiny orifices of small parasitic cones to huge circular chasms. That of Kilauea in the Sandwich Isles, the largest on the earth in an active state, is seven miles in circuit; but it is exceeded by others now extinct. These again are far exceeded by those on the surface of the moon, the action of its internal heat upon its surface having been far more violent in our comparatively small satellite than on our earth. The lunar crater Tycho is fifty miles in diameter and that of Copernicus not much smaller; whilst, if the "walled plains," such as Schickard and Clavius, are volcanoes, we must admit craters 133, and even 142 miles in diameter.

Cratinus, a Greek comic poet (519-422 B.C.), contemporary of Aristophanes. He wrote some twenty-one comedies, some of which took prizes in competition; his *Bottle* (*Putiné*), produced 433, in the poet's ninety-sixth year, taking the first prize, while the *Clouds* of Aristophanes took the third.

Craufurd, a British naval officer, was born 1764. He entered the navy in 1779. In 1790-2 he served on the *Agamemnon* against Tippoo, and in 1795 he was employed in the *Agamemnon* on a short time before 1800. In 1807 he was on the *Agamemnon* during the ill-fated expedition to the coast of Africa, and led the attack on the *Agamemnon*. In the following year he commanded the *Agamemnon* in Sir David Baird's division, and took part in the capture of Sir J. Moore's army. In 1809, when his brigade was sent to the coast of Spain, he was killed at Vigo. In 1810 he was in the *Agamemnon* in the light brigade at the battle of Trafalgar, and was killed. He was a brave and able officer, and his death was a great loss to the navy.

Craufurd, a British naval officer, was born 1764. He entered the navy in 1779. In 1790-2 he served on the *Agamemnon* against Tippoo, and in 1795 he was employed in the *Agamemnon* on a short time before 1800. In 1807 he was on the *Agamemnon* during the ill-fated expedition to the coast of Africa, and led the attack on the *Agamemnon*. In the following year he commanded the *Agamemnon* in Sir David Baird's division, and took part in the capture of Sir J. Moore's army. In 1809, when his brigade was sent to the coast of Spain, he was killed at Vigo. In 1810 he was in the *Agamemnon* in the light brigade at the battle of Trafalgar, and was killed. He was a brave and able officer, and his death was a great loss to the navy.

draw and execute wood carving, he practised monumental sculpture, and at the age of 20 he went to Rome, where he studied under Thorwaldsen. His *Orpheus in Search of Eurydice* (1839) brought him into notice, and he from that time was a great producer, ranking in Rome next after Gibson. In 1856 a tumour on the brain destroyed his sight, and he died in London, where he had come for advice. His son, F. MARION, born in 1854, was a successful novelist. He died in 1909.

Crayfish. The Crayfish is the most frequently quoted type of the Decapod Crustacea, as it is abundant in English streams, and its size is convenient for dissection. The name is a corruption of the French *écrevisse*, and is not in any way connected with "fish." The Crayfish consists of three regions—head, thorax, and abdomen; each of these is composed of a series of segments, more or less united together, and each bearing a pair of jointed appendages. There are twenty segments in all—five in the head, eight in the thorax, and seven in the abdomen. The head and thorax are closely united, and the hard shell which protects the animal is there formed into a large plate, the cephalothorax; the division into head and thorax is, however, marked by a furrow. The head bears in front a sharp projecting point (the rostrum), on each side of which is a large compound eye borne on a short movable stalk; on the under surface the head bears five pairs of appendages, viz. the antennules, antennæ, mandibles, and two maxillæ; the two first are the feeling organs, while the three last surround the mouth and are concerned in the crushing of the food. The thorax bears three pairs of jaw feet or maxillipedes, the chelæ or great claws, and four pairs of walking limbs. The abdomen is provided with six pairs of "swimmerets"; the last joint or telson has no appendages, but is flattened out with those of the preceding pair, and form the powerful swimming tail. The appendages, thus, have very varied functions, and their shape is consequently very different. Nevertheless, they are all constructed on one fundamental type. The simplest form is that of the swimmerets, which consists of a simple or two-jointed basal plate (the protopodite) bearing two filaments, of which the outer one is known as the exopodite, and the inner as the endopodite. The antennæ and antennules consist of the same three parts: the other appendages are more complex; thus, in the third jaw foot or maxillipede the basal part consists of two joints, of which the upper one bears a gill and tuft of hair or setæ; the endopodite consists of five joints, and the exopodite is slender and ends as a long filament. The mouth of the crayfish leads by a short œsophagus into a stomach, armed with a series of crushing teeth, forming a "digestive mill"; from this a long straight intestine leads to the anus. The nerve system consists of a long chain of pairs of ganglia, united by a pair of nerves, cords, and transverse commissures. At the anterior end of the nervous system is the "brain," situated above the mouth, and giving off nerves to the eyes and feelers; a pair of "commissures" connect this to another nerve mass formed by the fusion of five

pairs of ganglia; behind this is a chain of twelve pairs of ganglia, extending to the end of the abdomen. Respiration is effected by a series of nineteen pairs of gills, while there are also three rudimentary pairs; these are contained in a large branchial chamber on each side of the thorax; the gills are borne either on the limbs (podobranchs), on the side walls of the thorax (pleurobranchs), or on the membranes between the bases of the limbs and the walls (arthrobranchs). The water is driven through the branchial chamber by a spoon-shaped plate (scaphognathite) on the base of the second maxilla. The heart is placed on the middle of the dorsal side of the thorax, and is enclosed in a large "pericardium"; the blood is colourless. The kidneys are a pair of green glands, situated just in front of the mouth, and each opening on a small tubercle on the antenna. The auditory organs are a pair of small sacs, containing a series of hairs and grains (or otoliths), situated in the base of the antennules. The crayfish is carnivorous in habit; it usually walks about on the walking legs, but can swim back rapidly by the action of the abdomen. Its name is *Astacus fluviatilis*.

Crayon (French *craie*, chalk), a pencil made of fine pipeclay, and usually coloured artificially. White crayons, however, are made of chalk, black crayons sometimes of a black kind of chalk. Sometimes the term is applied to a drawing made with crayons. In lithography, the crayon used for drawing on lithographic stones consists of soap, wax, resins, lampblack, melted or burnt together.

Cream of Tartar. During the fermentation of grape juice for the production of wine, crystalline crusts are deposited on the casks, consisting chiefly of *acid potassium tartrate* ($H_5KC_4O_6$), and known as *argol*. By dissolving this in hot water, filtering with charcoal, clay, or albumen, and then allowing the liquid to crystallise, *cream of tartar* is obtained. It is generally, however, impure, containing small quantities of *calcium tartrate*. It forms rhombic crystals, and is only slightly soluble in cold water. Hot water, however, dissolves it more readily; and an intimate mixture with borax is easily soluble in the cold, and is known as *soluble cream of tartar*. It finds various industrial uses, as in manufacture of potassium carbonate, in silvering, dyeing, etc., and in medicine. In small doses it is used as a diuretic, while taken in larger quantities it acts as an aperient and purgative.

Creatine, a substance of composition $C_4H_9N_3O_2$, which is found in the muscles of all vertebrate animals, and to a smaller extent in the nerves and blood. It may be obtained from flesh or "meat extract" by digestion with water and subsequent purification. It forms monoclinic crystals, which are slightly soluble in cold, and readily in boiling, water. By evaporating the solution with an acid, a substance *creatinine* is obtained ($C_4H_7N_3O$), which is found in urine.

Creation, the formation of a material universe by the exercise of the Divine Will. As a philosophical theory of cosmogony (q.v.) it conflicts, on

the one hand, with the Oriental theory of emanation, according to which the world is a necessary product of the Divine nature; and with the modern view of evolution (q.v.) in some of its developments, as enunciated by some students of physical science, according to which the existing order is the necessary result of forces inherent in an eternally-existent matter or force. Both these theories appear to some extent to place a necessity above the Deity; the first in assuming another cause behind the First Cause, while evolution, though consistent with an original creative act, seems to involve a necessary sequence of cause and effect in subsequent production. "The whole creation," says Professor Huxley, "is the result of the mutual interaction, according to definite laws, of the forces possessed by the molecules, of which the primitive nebulosity of the universe was composed." This view throws back the question to that of the origin of force or motion. Yet St. Thomas Aquinas writes: "Only because creation was out of nothing, is God the First, Absolute, and Essential Cause of all things."

Entirely distinct from the question of the creation of the world are those of the interpretation of the six days of creation in the first chapter of *Genesis* and of the "special" creation of each species of plant and animal. As to the former question many diverse views have been held by orthodox thinkers. A long pause has been suggested between the creation of the heaven and the earth recorded in verse 1 and the creation of what is supposed to be the existing order of things described in later verses. Six periods of indefinite duration, corresponding, it is argued, to divisions of the geological record, has been a favourite view. Six visions from evening to morning vouchsafed to the inspired narrator is another suggestion; and, lastly and more metaphysical, six acts of the Divine volition, each possibly extending over a natural day of twenty-four hours, creating, not the actualities, but all future potentialities of nature. Heterodox interpreters look upon this cosmogony as merely the Hebrew guess at truth. As to this it is only necessary to make the obvious remarks; first, that the object of *Genesis* as of every other book in the Bible is clearly moral and not scientific, and that, therefore, even on the view of plenary inspiration only a general, perhaps rather a literary or poetical, correspondence with the teaching of science, is to be expected; and, secondly, that, as compared to every other cosmogony possibly older or contemporary or later and heatnen, this Hebrew belief has at once a sublimity, a precision, a simplicity, and a reasonableness that are at least remarkable.

As to the belief, naturally entertained before the careful observation of the variability of animal and vegetable forms, that the innumerable kinds or "species" of plants and animals have been originally created each distinct from each and immutable, it is, in the words of Sir Joseph Hooker, "purely speculative, incapable from its very nature of proof, teaching nothing and suggesting nothing, . . . the despair of investigators and inquiring minds." Some form of the doctrine of descent

Credit. Trust Receipts may be deferred payment, written order or at some cheque, or instrument.

Crédit Foncier, an institution, the primary object of which is to lend money on mortgage on the security of real property (French, *propriété foncière*). In Germany the first society of the kind was founded in 1770 in Silesia, to relieve the local landowners of their debts. It was a mutual society, the members being collectively responsible for the loans on mortgage made to each individually. In France a law regulating the formation of land mortgage companies was passed in 1852; but one society founded in that year, called the Banque Foncière de Paris, practically monopolised the field at once, and shortly changed its name to the Crédit Foncier de France. For a time under the Empire its chief officers were nominated by the Emperor. An offshoot, the Crédit Agricole, was founded in 1861, and a financial company, also called the Crédit Foncier of England, was founded in England in 1864, chiefly to finance public companies. The Crédit Mobilier of France lends on personal property. The Crédit Foncier of France has also undertaken other business, such as the promotion of companies, the raising of loans for Governments and municipalities, etc. For many years it supplied Baron Haussman with the wherewithal to beautify Paris. The humbler functions of such companies, as

originally projected, are performed in England to a great extent by building societies.

Crediton, on the Creedy, in Devonshire, a market town and borough eight miles N.W. of Exeter. It is in a valley between two steep hills, and consists of the old and the new town. There is a fine cruciform church with a central tower 100 feet high. St. Boniface, the Apostle of Germany, was born here. There were once woollen manufactures here. Most of the old houses were destroyed by fire during the 18th century. Pop. (1901), 3,974.

Creeds (Lat. *credo*, I believe), formal confessions of the chief articles of the Christian faith, perhaps alluded to in 2 Timothy i. 13, and elsewhere in St. Paul's Epistles. Whether they are traceable in the Apostolic age or not, forms of Apostolic doctrine which have some resemblance to them are found in Irenæus, Origen, and Tertullian. The Apostles' Creed (q.v.) is given by Rufinus of Aquileia (390 A.D.) in two forms, one in use at Aquileia, the other at Rome. Its present form dates back to the eighth century. The Nicene Creed (q.v.) was put forth by the General Council of Nicæa in 325 A.D., and supplemented by a Council of Constantinople, A.D. 381, in a manner not recognised by the Western Church. The Athanasian Creed (q.v.) was probably composed early in the fourth century A.D. Primarily the creeds were repeated by catechumens at their baptism, but not used otherwise in public worship. The Nicene Creed was introduced into the daily offices of the Greek Church about 450 A.D., into those of the Western Church in 589 A.D. Turning to the east at the creed is probably connected with the idea of the east as the source of light and place of the sunrise.

Creeks, a North American people belonging to the Appalachian group, who call themselves Muscogulgi (Muskhoghi), and who form two great divisions, the Upper Creeks, or Muskhoghi proper, of the Upper Alabama, and the Lower Creeks, or Seminoles, of the Lower Alabama and Flint rivers; both originally from beyond the Mississippi. The Seminoles, who appear to be the original stock, were formerly the dominant people in Florida, where a few are still met. But the bulk of the nation are now settled in Seminole Reserve, Indian Territory. The Upper Creeks formerly occupied the present States of Georgia and Alabama, but were also removed (1836) to a reserve in Indian Territory. Here they have made considerable material and intellectual progress, and now possess numerous schools, periodicals printed in a special character, a political constitution, and two chambers, one for the "kings," and the other for the "warriors." Nevertheless, they appear to be decreasing, having fallen from 14,500 in 1866 to little over 13,000 in 1900. J. W. Powell (*Linguistic Stocks of American Indians*, 1891) separates Seminole from Muskogean, and classes it with the nearly extinct Timuguanan stock language, at one time current throughout the whole of Florida.

Creeper, any bird of the family Certhiidae (q.v.), and especially *Certhia familiaris*, the Common

Creeper, widely distributed in Britain and in Europe. This bird, which is resident in the United Kingdom, is about five inches long; the plumage above is of various shades of brown, mixed with white, and the under surface is silvery white with a rufous tinge. It is usually found in woods and plantations or on old and isolated trees by the roadside, in the ascent of which, in its search for insects, it is materially aided by the stiff feathers of the tail. The nest is usually in a crack of a tree, and there are from four to eight eggs, which are white, more or less spotted with reddish-brown. The note is monotonous, and has been syllabled "twee-twee."

Crees, North American aborigines, one of the three north-western Algonquian nations, the two others being the Salteaux and the Maskegons. They call themselves Neyowock ("Men") and Iyinuvo ("People"), Cree being an English contraction of Kristeno, which derives through Knisteno from Kenistenovoh, the name applied to them by the Blackfeet. They formerly occupied a vast territory stretching from Manitoba to the Rocky mountains, partly prairie, partly forest, whence the Prairie Crees, hereditary foes of the Blackfeet, and the Forest Crees, scattered groups of fishers and hunters. Their Algonquin dialect, almost the same as that of the Maskegons, but differing greatly from that of the Salteaux, has been reduced to written form both by the French and English missionaries, and is said to be the simplest of all Algonquin tongues. Many now speak English and French, and at various dates since 1871 they have disposed of most of their hunting-grounds to the Canadian Government. The Maskegons (Muskaigos) are the so-called "Swampy Crees," who roam between Lake Winnipeg and Hudson Bay, as far north as the Churchill river, where they are conterminous with the Chippewyan Athabascans. The Salteaux domain lies between the Mouse and the Lower Saskatchewan rivers south and north. All are decreasing and gradually disappearing before the white settlers. (See A. Lacombe, *Dictionnaire, etc., de la Langue des Cris*, Montreal, 1874.)

Cremation (Latin *cremare*, to burn to ashes), the disposing of dead bodies by burning instead of burial. This was the practice of the ancient Greeks and Romans, the Celts, the ancient Assyrians, the Hindoos, and other nations; it was probably adopted originally to save the bodies of those slain in war from maltreatment by an enemy, e.g. by cannibalism. The Greeks and Romans burnt their bodies on open pyres, generally with various perfumes, and the ashes were preserved in urns. But the practice was checked by the material view of the "resurrection of the body" taken by the early Christians. In 1874 Sir Henry Thompson, the well-known physician, suggested the revival of the practice on sanitary grounds. The Cremation Society of England was formed, and a crematory furnace erected near Woking, Surrey. The scheme excited violent opposition among a section of the clergy, and from doubts as to the state of the law (set at rest in 1884 by the charge of Mr. Justice Stephen) no steps were taken by the society to

perform cremations until 1885. A Bill, however, to legalise the practice was introduced into the House of Commons in 1884, but opposed by the Government chiefly on the ground that it would facilitate the concealment of murders, and defeated by 149 to 79. In 1885, however, the Cremation Society first publicly performed a cremation at Woking and since then many bodies have been there dealt with. Crematoria have since been established at Manchester, Glasgow, Liverpool, Hull, Birmingham, Darlington, Sheffield, and other places. But cremation had taken place in England prior to the erection of crematoria. In 1769 the body of a Mrs. Pratt was burnt by her own wish in the Tyburn burying-ground. In 1883 and 1884 three cremations took place in a private crematory in Dorset, while a Dr. Pryce cremated his child on an open pyre in Wales. Cremation has been legalised in France, Germany, and Italy, and crematory furnaces now exist at Père la Chaise (Paris), Dresden, Gotha, Milan, Rome, and elsewhere. Cremation is opposed partly on grounds of sentiment, but mainly because it is feared that it would greatly increase the difficulty of detecting murders. Its advocates, however, reply that mineral poison would still be traceable in the ashes, while in suspicious cases the internal organs could be kept for analysis. They propose also that a "medecin verificateur" (as is usual in France) shall be appointed in every district to examine carefully into the causes of all deaths. The sanitary advantages of the practice are immense; the germs of zymotic diseases are, under the present method of burial, multiplied and diffused, and often pollute drinking water. Moreover, the waste of land in ordinary burial is serious. Chemically, burning effects in an hour or two what burial does in many years. In a cremation furnace the destructive effects of the gas generated from the body are passed over the body. The gas is then carried through and under the body, and is blown out into the air, so as to prevent any infection. The process takes from one to two hours.

Cremona, an Italian town, capital of the province of Cremona, situated on the left bank of the Po, 46 miles from Milan. It is well built and is surrounded by fertile fields. Its churches have many fine specimens of the ancient cathedral style, the most notable being the thirteenth-century tower of the cathedral is 396 feet high. The town is famous for its musical instruments, especially violins. It was founded by the Romans.

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Creole, a person of mixed blood, especially one of the whites of the colonies. The word is derived from the Spanish word *criollo*, which means a person born in the country.

whence the English form) in an analogous sense; later used loosely, especially by English writers, for any descendants of the Spaniards, French, and Portuguese, whether pure or mixed, where the white element predominates; lastly applied to blacks of pure descent (Brazil), to the issue of whites and Mestizos (Peru) and to Mestizos or half-castes generally (Alaska). Both in Spanish and Portuguese *criado* has the secondary meaning of servant or slave, which may explain the later confusion and baser use of the word. *Malcriado*, in Spanish and Portuguese, and *malcreato* in Italian, mean ill-bred, rude, unmannerly.

Creosote (CREASOTE or KREASOTE). This name was first applied in 1832 to a colourless liquid with a penetrating odour obtained by the distillation of the tar from beech wood. The name was also afterwards given to the *carbolic acid* obtained from coal tar, the two substances being supposed to be identical. "Creosote" is now generally applied as a generic term to those products of distillation of wood tar, coal tar, shale oil, etc., which consist largely of carbolic acid or compounds chemically analogous to it. Wood-tar creosote consists chiefly of *guaiacol* ($C_7H_8O_2$) and *creosol* ($C_8H_{10}O_2$). It boils at about 205° to 220° , and acts as an antiseptic, its name being derived from its power of preserving meat from putrefaction (*creas*, meat; *sozo*, I save). Coal-tar creosote is a very important substance commercially, and is very largely used for "creosoting" timber, softening pitch, illumination, fuel, and as an antiseptic. It varies in composition, but generally consists chiefly of *carbolic acid*, *creosol*, *scylenol* ($C_8H_{10}O$), with dissolved solid hydrocarbons and basic substances. There are three pharmacopœial preparations of this drug, *Mistura*, *Argentum*, and *Vapor Creasoti*. The ointment is used in certain forms of skin disease. The vapour is used as a deodorant and disinfectant in cases where the breath is foul, in combination with iodine, ether, and chloroform. The vapour of creosote has been largely employed of late years in the antiseptic treatment of phthisis. Administered internally, creosote is employed to check vomiting. Locally applied, a drop of creosote is sometimes of service in alleviating the pain of toothache.

Crescent (Lat. *cresco*, to grow), the moon when "waxing," i.e. in her first two quarters; hence, anything of similar shape, specially applied to the Turkish standard, which was originally the standard of Byzantium, afterwards Constantinople, and was adopted by the Turks on their capture of that city in 1458.

Cress, the popular name (from the Teutonic, *kers*, *carse*) applied to a variety of plants mostly members of the order *Cruciferae* (q.v.), with pungent, but wholesome, leaves. *Lepidium sativum*, seedlings of which are eaten as salad with those of mustard, and *Nasturtium officinale*, the water-cress (q.v.), are especially so-called. The garden Nasturtiums (*Tropaeolum majus* and *T. minus*), which are similarly pungent, though belonging to a widely different family, the *Geraniaceae*, were formerly known as Indian cress.

Cresswell, THE RIGHT HON. SIR CRESSWELL, born at Blackheath in 1794, and educated at the Charterhouse and Cambridge, was called to the bar at the Middle Temple in 1819, and joined the northern circuit. With Mr. Bramwell he compiled a valuable series of reports, and in 1830 became Recorder of Hull, being returned as Conservative M.P. for Liverpool in 1837. Sir Robert Peel appointed him in 1842 a Justice of Common Pleas, and sixteen years later he was selected to preside over the newly-constituted Divorce Court. He filled this exceedingly arduous post with conspicuous ability and tact, and his decisions form a solid basis of law built upon new and dangerous ground. In 1863, whilst in the full exercise of his powers, he unhappily met with a carriage accident, which terminated fatally.

Cresting, or CRESTE, in architecture, an ornamental finish to a gable, or to the summit of a roof.

Creswick, THOMAS, R.A., was born at Sheffield in 1811, and, after beginning his artistic education in Birmingham, came to London at the age of 17. He was fortunate enough to attract early attention by a series of Welsh and Irish landscapes that gained admission to the Royal Academy and the British Institution. His work was remarkable for its faithful rendering of British scenery, and for the skill with which trees and foliage were reproduced. In 1842 he was elected A.R.A., and received full honours in 1851. Of the 265 paintings which he exhibited, the most noteworthy are *The Pathway to the Village Church*, now in the National Gallery; *A Scene on the Tummel* and *A Summer's Afternoon*, to be seen at South Kensington; *The Weald of Kent* (1843), *The Old Foot Road* (1846), *The Valley Mill* (1851), and *Across the Beck* (1864). He also illustrated with success Thomson's *Seasons*, Walton's *Angler*, Tennyson's *Poems*, and the *Book of British Ballads*. His death took place in 1869.

Cretaceous System, though taking its name from what is to us its most familiar rock, the Chalk (Latin, *creta*), varies very much petrographically. In Europe, when it was laid down, there were two areas of deposit: the southern, an open-sea area through the Mediterranean region into Hindostan, represented by massive limestone containing a remarkable group of pelecypod mollusks, the *Hippuritidæ* (q.v.); the north-western, a shallower water area, from Bohemia into Britain, represented first—in its lower half—by sands and clays containing phosphatic nodules (q.v.), and largely green from the presence of glauconite (q.v.), and subsequently—in the upper part of the series—by white chalk (q.v.). In the lower part the plant-remains resemble those of the subjacent Jurassic (q.v.) rocks; but in the upper, dicotyledons (q.v.) occur in considerable variety at Aix-la-Chapelle, in Dakota, and even in the north of Greenland. The chalk (q.v.) itself is largely composed of foraminifera (q.v.), of which *Globigerina* is one of the most abundant. Siliceous sponges were numerous, including *Siphonia* and *Ventriculites*, forming the nuclei of many of the

flint (q.v.) nodules, bands of which characterise the Upper Chalk. Corals and crinoids were not abundant; but echinoids were especially so, including *Cidaris*, *Ananhytes*, *Micraster*, and *Echinoconus*. The brachiopods *Terebratula* and *Rhynchonella*, and the pelecypods *Ostrea*, *Exogyra*, *Pecten*, and *Inoceramus* were numerous, and in addition to the last of the belemnites and ammonites we have a remarkable variety of unrolled ammonitids, including *Turritiles*, *Hamites*, *Baculites*, etc. Among fishes, in addition to elasmobranchs, such as sharks and rays, there were during the later half of the period the earliest teleostean or true bony fishes. The chief reptiles were the huge terrestrial herbivorous dinosaur *Iguanodon* (q.v.) and the marine serpent-like *Mosasaurus*, besides the last pterodactyls and ichthyosaurs. No mammals are as yet known from Cretaceous rocks of the Old World, though some have been described in the United States; but in Kansas both ratite and carinate birds are represented by the toothed forms *Hesperornis* and *Ichthyornis*. In northern Europe the system is thus divided into series, named mostly from French localities:—

Upper. DANIAN or MAESTRICHTIAN. Absent in England. Faxe in Denmark.

SENONIAN, or UPPER CHALK, with flints, named from Sens.

TURONIAN, or LOWER CHALK, without flints, named from Touraine.

CENOMANIAN, marly chalk and Upper Greensand, named from Mans (Cenomanum), and

ALBIAN, or GAULT clay (q.v.), named from Aube.

Lower. NEOCOMIAN, named from Neuchâtel (Neocomum) represented in England by the upper part of the marine Speeton clay and the freshwater Wealden and marine Lower Greensand.

A slight unconformity and a marked palæontological break usually separates the Neocomian from the Upper Cretaceous. In India during this period the Deccan traps, 4,000 to 5,000 feet thick, over 200,000 square miles, were erupted. In the western United States Cretaceous rocks reach a thickness of 11,000 to 13,000 feet, and there and in New Zealand there seems to be no great break between them and overlying Tertiary rocks. In Britain an over most of Europe, on the other hand, the close of the Secondary period is indicated by a marked break at the top of the Cretaceous.

Crete (Gk. *Krētē*, Lat. *Creta*, Mod. *Candia* Turk. *Kiaid*), an island in the Mediterranean, S. of the Greek Archipelago. It is about 160 miles long E. to W., and has a breadth of from 6 to 35 miles with an area of 3,300 square miles. Mountainous the centre, the chief peak *Upsilorites* (the ancient *Ida*) rising to 7,674 feet, it possesses fertile plains and valleys watered by numerous springs which in winter rains swell into torrents. The coasts are indented and cavernous. Olives, oranges, lemons, raisins, wine, and silk are among the chief products, and sponges of the best quality are found on its shores. Crete was a thriving centre of Greek civilisation in pre-Homeric times. Minos, its mythological king, was famed as a law-giver and as first creator of a navy. Homer speaks of hundred cities. Brought under the Roman yoke

Cricket, the national game of England, is an outdoor game played by twenty-two players, eleven a side. The game may be divided into three branches, *batting*, *bowling*, and *fielding*. The batsmen, of whom there are always two in at once, one at each end, have to defend against the bowlers their *wickets*, which consist of three stumps driven into the ground so that they stand 27 inches above the ground, and placed so that the ball cannot go between them; on the top of the stumps are laid the bails. The *bat* must not exceed $4\frac{1}{4}$ inches in width at the broadest part, and must not be more than 38 inches long; the wickets are pitched opposite to each other with a distance of 22 yards between them. At a distance of four feet from the wicket is marked a *popping-crease*, within which the batsman is said to be in his ground. The *ball*, not more than $5\frac{3}{4}$ oz. nor less than $5\frac{1}{2}$ oz. in weight, must measure not less than 9 nor more than $9\frac{1}{4}$ inches in circumference. The batsman scores by means

of *runs*, i.e. if he strikes the ball when bowled to him, and can run to the opposite wicket before the opposing side has time to knock off the bails with the ball, he scores one run. The side which scores the largest number of runs wins. A batsman may be "out" in various ways: (1) He may be bowled, when the bowler breaks through his defence and knocks the bails off his wicket; (2) he may be caught, when any fieldsmen catches the ball directly off his bat before it has touched the ground; (3) he may be run out, when he fails to reach the popping-crease after a run before the bails are knocked off; he may be "l. b. w." (leg before wicket) when he interposes his leg between a straight ball and the wicket; he may be "h. w." (hit wicket) when the bowler drives him back so that he knocks off his own bails with his bat; he may be stumped, when both his feet and his bat are

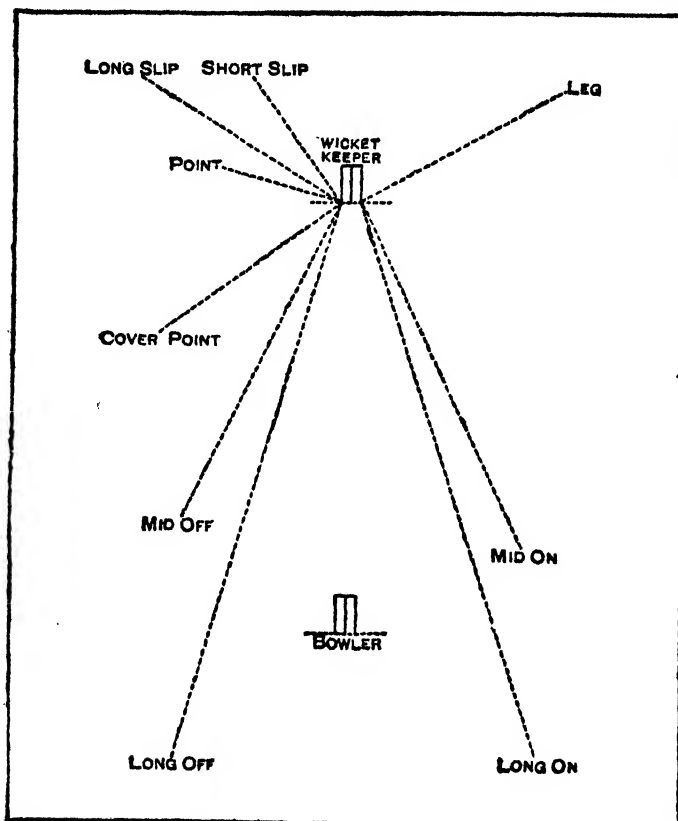


DIAGRAM OF FIELDSMEN PLACED FOR MEDIUM BOWLING, AS FOR HEARNE.

beyond the popping-crease and the wicket is put down while the ball is in play. Of batsmen who have earned great reputation in more recent years, Grace, Fry, Noble, Maclaren, Trumper, Hill, Ranjitsinhji, Jackson, Hayward, Jessop, and others might be noted. The bowler delivers the ball with one foot within the bowling-crease, and he bowls six balls in succession; at the end of the six balls the bowling commences from the opposite end; each series of six balls is called an "over." The ball must be bowled, and if thrown or jerked is called a "no-ball," which counts as one run to the opposite side; if the ball falls so as to be, in the judgment of the umpire, beyond the batsmen's reach, it is called a "wide," and counts as one run to the other side. In former years a ball was

counted a no-ball if delivered above the bowler's shoulder. Very fast bowling has, of late years, gone somewhat out of fashion, and at the present day, with a few notable exceptions, the best bowlers all adopt a medium pace, tending rather towards slow than fast. Great interest was aroused in 1900 by the question of "throwing" coming to a head. Several well-known bowlers were prohibited from bowling at all, and others were cautioned as to the nature of their delivery. Among famous bowlers of recent years are Shaw, Lohmann, Briggs, Spofforth, Giffen, Lockwood, Richardson, J. T. Hearne, Hirst, Rhodes, Tarrant, and Blythe. Of the fieldsmen, whose positions naturally vary according to the character of the bowling or of the batsman, the wicket-keeper demands the first attention; he is always situated directly behind the wicket, which is being defended by the batsman and attacked by the bowler; this position calls for a very quick eye, as a wicket-keeper must be on the alert for balls which pass the batsman, both with the view of saving "byes" and stumping. *Point* is situated on the "off" or right-hand side of the wicket-keeper, frequently "square" with the wicket, i.e. in a straight line with the popping-crease, or sometimes rather behind the wicket. *Cover point* is generally placed behind point more towards the middle of the field; *mid-on* is on the opposite side pretty close in, between the two wickets; *mid-off* occupies a somewhat similar position on the off side but rather farther from the wicket-keeper; *slip* is a little way behind the wicket-keeper on the off side; *square leg* is on the on side, directly in a line with the batsman who receives the ball; *third man* stands between *slip* and *point*; *long-off*, *long-on*, *long-leg*, are simply placed far away from the wickets in the positions indicated. A *long-stop* (or fieldsmen directly behind the wicket-keeper) is now rarely used, owing to the great improvement in wicket-keeping.

When ten men on one side have been got out, that side is said to have completed an innings; no side has more than two innings in a match. There are always two umpires in the field, whose duties are to see that the game is played fairly in every way.

Single wicket, a variety of the game played, as the name implies, with only one wicket, is seldom seen now-a-days.

In England first-class matches are generally limited to three days, and those which cannot be completed within that time are said to be drawn. County cricket has developed to a very large extent within the last few years, and of late the visits of the Australian teams have given an increased interest to the national pastime.

The origin of cricket is involved in a certain amount of obscurity. There is no doubt, however, that in Elizabeth's reign cricket as cricket was played by the youth of England. The forms of the bat and the wickets were somewhat different, but in all its main elements the game was the same. In the eighteenth century cricket was very popular, and many references to it have been found in the literature of the period; indeed, at this time one writer (1743) complains that it may be carried too far, that it fosters an undue mixing of the classes

with the masses, and "propagates a spirit of idleness." Nyren (b. 1764) published a *Cricketers' Guide*, and later the famous Lillywhite issued his *Handbook of Cricket*. It was this Lillywhite who practically introduced the system of round-arm bowling. The Marylebone Cricket Club, generally known as the M.C.C., which was founded about the beginning of the 19th century, has done more to promote the welfare of cricket than any other institution. It is the M.C.C. which has framed and tabulated the laws by which the game is played the whole country through; any disputed point, any reform is brought before the M.C.C. and there dealt with by competent cricketers; moreover, by arranging for the visits of Colonial teams, by zealously promoting all county cricket, the M.C.C. has conferred a lasting boon upon all true lovers of the game.

There are, probably, few games existing which possess so truly national a character and which excite such universal interest in England as cricket. In the smallest village, in the busiest town, there will be found youthful cricketers who take a very keen interest in the scores made at county matches, and there are very few Englishmen who do not watch with the greatest anxiety the progress of a match between England and Australia. The encouragement which is given to cricket at our schools and universities doubtless fosters this spirit to a considerable extent, but the love of cricket extends to all classes of Englishmen, and at the present day the writer of 1743 would doubtless have far more cause of complaint against the game for its tendency to unite the different classes of society.

Crickets, a group of insects belonging to the family *Achetidae* and order Orthoptera. The best known English species is *Acheta domestica*, the common brown house cricket. The largest British species is the *M. gryllus* (q.v.) well known for its voracious habits. The *Leucophaea* and *Leucophaea* are the largest living crickets. Some species are wingless, and are called "dwarfs" or "large woodlice."

Crillon, Louis, a French nobleman, born in 1688, and served with distinction in the Seven Years' War. He transferred his allegiance to the British, and was recaptured Minorca in 1756. His son (1756-1800) took an active part as a soldier in the early events of the French Revolution. He was one of the founders of the *Legion of Honour*. He escaped from the guillotine in 1793, and was made a peer of France in 1802.

Crime, a public wrong, that is, a wrong done to the community at large (as distinguished from a *tort* or wrong done to an individual), and comprehends all acts amounting to treason, felony, or misdemeanor. The distinction of public wrongs from private—of crimes from civil injuries—seems upon examination chiefly to consist in this, that private wrongs or civil injuries are an infringement or privation of the civil rights, which belong to individuals considered merely as individuals, while public wrongs, that is, crimes and misdemeanors, are a violation of the same rights considered with reference to their effect on the community in its aggregate capacity. As if A detains a field from another man B, to which the law has given him a right, that is a civil injury and not a crime, for here only the right of an individual is concerned; and it is immaterial to the public which of them is in possession of the land. But treason, murder, and robbery are properly ranked among crimes, since, besides the injury done to individuals, they strike at the very root of society, which cannot properly exist where acts of this sort are suffered with impunity. In all cases crime includes an injury, that is, every public offence is also a private wrong, for while it affects the individual, it affects also the community. Thus, treason in imagining the sovereign's death involves in it conspiracy against an individual, which is also a civil injury, but as this species of treason in its consequences principally tends to the dissolution of government and the destruction thereby of the order and peace of society, this raises it to a crime of the highest magnitude. Murder is an injury to the life of an individual, but the law of society considers principally the loss which the State sustains by being deprived of a member, and the pernicious example thereby set to others. Robbery is an injury to private property, but were that all, a civil satisfaction in damages might atone for it. The public mischief is the thing for the prevention of which our laws make it a felony. In these gross and atrocious injuries the private wrong is absorbed in the public, and that is why we seldom find any mention made of satisfaction to the individual in such cases, the satisfaction required by the community being so great. But there are crimes of a lower kind, in which the public punishment is not so severe, such as battery or assault, in which the aggressor may either be indicted and punished by fine and imprisonment for disturbing the public peace, or the injured party may have his private remedy by a civil action for damages. So in the case of a public nuisance as digging a ditch across a highway, this is also punishable by indictment; and if any individual sustains special damage thereby as by laming his horse, breaking his carriage, etc., the offender may be compelled to make ample satisfaction as well for the private injury as for the public wrong. And thus the law has a double view in its cognisance of wrongs, viz.

for him. He was a great favourite with Henry IV., who wrote to him from the battle-field—"Pends-toi, brave Crillon! Nous avons combattu à Arques, et tu n'y étais pas." He died at Avignon in 1615.

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to redress the party injured by restoring to him his right, or by giving him an equivalent, and to provide for the public benefit by preventing or punishing every breach or violation of those laws, which the sovereign power has thought fit to establish for the government and tranquillity of the State.

Crimea (Lat. *Chersonesus Taurica*, Russ. *Krym*), a peninsula jutting from the S. coast of Russia into the Black Sea, which it divides from the Sea of Azov to the E. It is connected with the mainland by the Isthmus of Perekop, about 6 miles wide, and is separated from the Caucasian provinces by the narrow straits of Kertch and Yenikaleh. Rhomboidal in form, with an irregular projection, the promontory of Kertch, it measures 125 miles N. to S. by 200 miles E. to W., and has an area of about 10,000 square miles. The northern portion is a continuation of the Russian steppes, but to the S. volcanic mountains rise to 4,000 or 5,000 feet. The few rivers are mere torrents. The climate on the whole is favourable, though droughts prevail in summer, and the winters bring rain and wind. Cereals grow, but not extensively, the chief products being wine, fruits, flax, tobacco, and timber. The excellent pastures support numbers of cattle, horses, and merino sheep. Wild-fowl and fish are abundant. Salt is the most valuable export. The population consists mainly of Tatar Mohammedans, but Greeks, Russians, Armenians, Gypsies, Karaim Jews, and Germans monopolise the trade. The peninsula forms part of the Taurida government, and Simferopol is the capital, a well-built and fairly prosperous town. Sebastopol possesses a magnificent harbour, fortified by Catherine II., destroyed by the allies in 1855, and since reconstructed as a great arsenal and military port. It is now connected by railway with Simferopol and the mainland. Kertch, strongly fortified, is the centre of the cattle and grain trade; Eupatoria exports most of the salt; Yalta is a favourite watering-place; Baghtchascrai and Kara-son-Bazar are reserved for Tatars. The Tsar has an oriental palace near the former town, and a fine marine palace at Yalta. The Crimea was occupied in prehistoric times by a Cimmerian race, who in the seventh century B.C. were driven out by the Scythians, a remnant only under the name Tauri being left among the caves and mountain fastnesses. These were the worshippers of Artemis referred to in the Homeric legends. Heracleote Greeks founded in 658 B.C. a colony almost on the site of Sebastopol, which existed until 1363 A.D. Other Greeks settled in the land, and ultimately established the kingdom of the Bosphorus, which was ceded to Mithridates, and held under Roman protection by his son Pharnaces. The Alans, Goths, Huns, Khazars, and Kiptchaks, successively overran the country, and Venice and Genoa had settlements there. Then a Tatar Khanate was founded in the fifteenth century, but was speedily made tributary to the Sultan, and was finally annexed by Russia in 1783. The Crimea is specially interesting to Englishmen as having been the scene of the war of 1853-56, in which so much blood and treasure were wasted. The localities made memorable by that

struggle, Alma, Tchernaya, Balaklava, and Inkerman, are treated of under their respective heads.

Crimean War, THE, between Russia on the one side, and England, France, and Turkey, and later Sardinia, on the other, broke out in 1854, and lasted until the final evacuation on July 12th, 1856. There can be no injustice in saying that the real cause of the war was Russian ambition, though the ostensible motive on Russia's part was the protection of the Christians who were under Turkish rule. As far back as 1844 the Czar Nicholas had proposed to enter upon the "sick man's" possessions and divide them. When the English and French declared war on the 28th March, 1854, Osman Pasha had been holding out bravely on the Danube, and when the allied troops had lain for a time at Varna, where they suffered greatly from cholera, it was concluded that there was no real need for their presence there, and, in accordance with a resolution to carry the war into the Crimea, a landing was made on the 14th of December by an army of 25,000 English troops under Lord Raglan, about the same number of French troops under Marshal St. Arnaud, and a Turkish contingent of 8,000, which army was increased in 1855 by the arrival of the Sardinian force. After forcing the passage of the Alma, the attacking army made a flank march, and were met by the Russians in force at Balaklava, an English fleet following the march along the coast. The battle of Balaklava is chiefly notable for the brilliant but disastrous Light Cavalry charge, which, by its mistaken object and untoward result, quite put into the shade an equally brilliant Heavy Cavalry charge earlier in the day. After the battle of Balaklava, the allies proceeded to invest the strongly fortified town of Sebastopol from the land side, while the English fleet blockaded and attacked it from the sea, the Russian fleet in the meantime finding shelter in the harbour, the entrance to which was blocked by the sinking of some stone-laden ships across the mouth. While the war was in this way carried on in the south, a fleet had been sent into the Baltic in the spring of 1854. The Russian fleet did not venture to give battle, but sought shelter behind the fortresses of Cronstadt and Sveaborg. The only work accomplished by the British fleet was the storming and taking of Bomarsund and of the Aland Islands. A second campaign in 1855 in this direction resulted in the bombardment and partial destruction of Sveaborg. A third battle in the south—Inkerman—was fought upon the 5th of November, 1854, in which the British eventually, aided by the French, held their own for some time against and finally repulsed a greatly outnumbering force of Russians, who had made a determined sally under cover of the dark November morning. Then followed a terrible winter of privation and suffering for the besiegers, who returned from severe work in the trenches to find a camp ill-provided with the simplest necessities of life, and a totally inadequate organisation for the treatment of the sick and wounded. Private enterprise did much to make up for official shortcomings, and many a Crimean soldier had reason to thank the

thoughtfulness that provided him with warm clothing and a few simple luxuries, and the devotion of Florence Nightingale and her heroic band of nurses. The siege lingered on till September, 1855, when the storming of the Malakoff fort by the French, and the not altogether well-managed attack upon the Redan by the British, led to the retreat of the Russians from the town. The peace of Paris was concluded on the 30th of March, 1855. Upon the Russian side the most important result achieved was the surrender of Kars after a noble defence by General Williams and a Turkish force. The present British occupation of Cyprus has for one of the conditions of its cessation the restoration of Kars. One condition imposed upon the Russians by the peace of Paris was that they should not construct a Black Sea fleet, but this condition Russia, in 1871, declared her intention of repudiating. The Crimean War has been considered by some a huge political blunder from beginning to end; but it had, at any rate, some good results—it showed how utterly a peace of forty years had thrown our military supply organisation out of gear, and so led the way to those improvements which, all inadequate as they are, have put us upon a somewhat better footing for facing a European foe; it led to a total revolution in hospital arrangements—a change much needed, for the great majority of deaths in the Crimean War were the result of deficient hospital arrangements; and it put us in a better condition for coping with the Sepoy mutiny which followed immediately upon the Crimean War. The most elaborate history of the war is that of Kinglake, but it is much too cumbrous to give a comprehensive view, since it is not till the fifth volume that Inkermann is reached, and one reads 100 pages before reaching 8 o'clock in the morning of that eventful November day.

Criminal Conversation.—The name of an action formerly known as *adultery*, which a husband sought damages for in the seduction of his wife. It was formerly a crime by a statute of Victoria, but now may now petition the Privy Council for a writ of *habeas corpus* from the High Court for a divorce.

Criminal Conversation.—[See INFORMATION.]

Criminal Conversation.—[See COURTS OF.]

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Criminal Conversation.—[See COURTS OF.]

Crinoidea. The Crinoids or Sea Lilies are a class of Echinodermata (q.v.), which have recently been defined in the language of modern biology as a caliculate, actinogonidiate, statozoic, pelmatozoic and possibly apelmatozoic Echinoderms. All this simply means that the Crinoids are animals which belong to the group of the Echinoderms, that they generally possess a stem by which they are fixed at least at one stage of their existence, that their reproductive organs are arranged radially, and that the body is lodged in a cup formed typically of ten plates arranged in two circles. The only living Crinoid that is met with on the British coast is the "Rosy Feather Star," or *Antedon*, for a figure and description of which see *ante* vol. i. pp. 143-4. This is not, however, a good representative of the class, as it is fixed only in its larval stages while the adult is free-swimming. A typical Crinoid such as *Pentacrinus*, consists of three main parts—a crown, a stem, and a root. The crown is the most important part, and contains the viscera; it consists of the calyx and the arms; the part of the calyx below the bases of the arms is known as the dorsal cup, and is typically composed of ten plates placed in two circles of five each; these are the basals and radials. In many Crinoids there is also a third ring of plates below the basals, and therefore known as underbasals; in the *Eugeniocrinus* and some others the basals are rudimentary, while in others, such as *Platycrinus*, the basals are large but only three in number. Above this radial ring of plates there is often a series of additional plates of which some are placed above the radials while others occur above the angles between them; these are known as interradians. The plates above the radials are continued up to form the arms, which may be simple and five in number, or they may be any multiple of five formed by the branching of the radial series. The arms are composed of numerous small ossicles, which are grooved on the upper side; along these grooves the food is carried by currents of water to the mouth; the arms bear smaller branches known as pinnules, and in these the generative products are formed. The mouth is situated at the centre of the upper surface, and to it the five food grooves converge; the mouth opens to a short-coiled oesophagus or "gut," and the anus is also on the upper or oral surface. The mass of the soft tissues of the body enclosing the digestive system, etc., is situated within the calyx and is known as the disc. Below it, just above the stem, is the "chambered organ," from which five cords pass up into the arms; the function of this structure was long uncertain, but it is now known to be the nerve centre, and the cords proceeding from it are the nerves. The stem is composed of a number of separate joints or ossicles united end to end; in section they are round, oval, pentagonal, or stellate; most of them are so loosely connected together as to allow the stem to be flexible; most stems bear side branches or cirri. The stem may be of great length, and in some Jurassic crinoids was as much as sixty feet high. In other cases it is short, or it may be suppressed as in *Holopus* thrown off during development as in *Antedon*; some it was extremely slender and wound round

corals or the stems of other Crinoids. The root may be either encrusting as in the Oolitic *Apocrinus* or spindle-shaped or branched, or the crinoid may anchor itself by the lowest whorl of cirri. The Crinoids are a very ancient class, as they commenced in the Cambrian system. Their stems are very commonly found as fossils, and whole masses of limestone are sometimes composed almost entirely of them; such is the Grey Carboniferous Limestone of Derbyshire. They are gregarious, and are now mainly restricted to the deep seas; and consequently were once very seldom met with. It was, therefore, generally thought that the class was becoming extinct, but later explorations have shown that they still occur in vast numbers forming large forests in the deeper seas. The Crinoids are all marine.

Crinoline (Lat. *crinis*, hair, *linum*, flax), a kind of hair-cloth used for stiffening underskirts of women and making the dress bulge out. In and about 1860 the name was applied to the magnified mousetraps composed of narrow bands or wires of steel, which hid all female grace by transforming a woman into an awkward, ungainly balloon. Those of us who do not recollect them may get a clear idea of some of their features, and the awkward mishaps they gave rise to, by studying the engravings in *Punch*, where Leech so faithfully mirrored passing customs and fashions.

Crisiidae, a family of Cyclostomata (q.v.), in which the colony (Zoarium) is branching, consists of a series of jointed segments, each of which is composed of one or two series of tubes. *Crisia cornuta* (Linn.) or the "Goat's Horn Coralline" and *Crisia eburnea* (Linn.) or the "Tufted Ivory Coralline," are the two best known English species of this family.

Crispin and **Crispinian**, two brothers born at Rome in the third century A.D. They embraced Christianity, and to avoid the persecutions under Diocletian, fled into Gaul, where they accompanied St. Denis to Soissons. They preached by day, and made shoes by night, the leather being supplied, according to one account, by an angel, according to another by theft. They were beheaded, it is said, in 287, and October 25th is kept as their day, being the anniversary also of the battles of Agincourt and Balaklava. They are the patrons of shoemakers.

Critchett, GEORGE, was born at Highgate in 1817, and after being educated at the London Hospital, became a member and subsequently a Fellow of the Royal College of Surgeons. Until 1846 he remained on the staff of the hospital engaged in general surgical practice, but in that year he took an appointment at the Ophthalmic Hospital, Moorfields, and thenceforward became known as one of the ablest specialists for diseases of the eye. Until just before his death, in 1882, he enjoyed unrivalled fame as an operator, and his lectures on "Diseases of the Eye" are still in high esteem. In private life he was very popular owing to his genial disposition, artistic tastes, and fondness for outdoor sports.

Critias, the Athenian orator, poet, and statesman, was a relative of Plato, and a pupil of Socrates. He appears to have devoted himself to intrigues in Thessaly and at home, with the result that he was exiled in 406 B.C. Returning with Lysander he became one of the *Thirty Tyrants*, and put to death Theramenes and others. He was killed in 404 whilst resisting Thrasybulus.

Critical Angle, in *Optics*, is the greatest angle to the perpendicular, at which rays of light can be refracted from one medium to another. Critical angles only exist when light passes from one medium to another in which its speed is greater, as, for example, when it passes from water to air. The critical angle in this case is about $48\frac{1}{2}^{\circ}$; for crown glass to air it is $40\frac{1}{2}^{\circ}$. [LIGHT, REFRACTION.]

Critical Temperature, in *Physics*, is that temperature for any special gas, above which it cannot be liquefied, however great the pressure to which we subject it. Every substance may, therefore, be regarded as truly gaseous at temperatures above the critical point. Thus, the critical point for carbon dioxide is 30.9° C., a result obtained in 1869 by Dr. Andrews, to whom much of our knowledge of this subject is due. The critical points of hydrogen, oxygen, and nitrogen are all very low; hence, at ordinary temperatures they may be well called permanent gases. [LIQUEFACTION.]

Croatia forms, with Slavonia and the districts formerly known as the Military Frontier, a Crown Land in the kingdom of Hungary and empire of Austria. The total area is 16,785 square miles. This region is bounded N. and N.E. by Hungary, N.W. by Carniola and Styria, S. by Servia, Bosnia, and Dalmatia, and W. by Dalmatia and the Adriatic. It has a coast-line of about 84 miles, but very few harbours. It is divided physically into two sections, (1) the basin of the Danube with its tributaries, the Drave, and the Save, and (2) the mountainous tracts, prolongations of the Alpine and the Karst systems, that stretch along the coast. The numerous rivers are liable to disastrous floods, and expand into broad marshes. The climate is mild, but the maritime portions are affected by the blighting Bora. Corn, maize, millet, flax, hemp, tobacco, grapes, plum-brandy, and silk are produced in the valleys, whilst the mountain forests yield plenty of timber, and small quantities of coal, iron, silver, copper, and lead. The country is now being opened up by railways. Originally part of the Roman province of Pannonia, Croatia, and Slavonia were conquered by Slavs in the seventh century, became an independent kingdom in 900 A.D., and were attached to Illyria from 1767 to 1777, and afterwards passed into Hungary. There is, however, a bitter enmity between the Croats and the Magyars, which has led to frequent disturbances. Since the 7th century Croatia has been almost exclusively inhabited by a people belonging to the Serb, or southern branch of the Slav family (Yugo-Slavs). They came originally from beyond the Carpathians, whence their name, Charpati, Charvati, Hrvati, Croati, meaning "Highlanders." (For the transposition of *r* compare *third* with

upper, and so is visible when the mouth is closed. The hind legs have a kind of scaly fringe, and the toes are completely webbed. Most species are entirely fluviatile, but some frequent brackish water, and two or three take to the sea. They feed largely on fish, especially when young, when full-grown on the smaller mammals, and sometimes successfully attack man himself. The Nilotic Crocodile (*C. vulgaris*) is widely distributed in Africa, and is said to attain a length of thirty feet; specimens of half that length are in the Natural History Museum, South Kensington. It was worshipped when alive and embalmed when dead by some of the ancient Egyptians, though others "made them an article of food." A plover (*Pluvianus aegyptius*) lives in a kind of companionship with the crocodile, clearing its body and, according to Herodotus, its throat of parasites, and warning it of danger by loud cries. The skin, which is tanned for leather, the fat, and the musk-glands of the lower jaw are articles of commerce. *C. cataphractus* and *C. niger* are both from the west coast of Africa; the former has a very long thin snout, while the head of the latter is short and broad like that of an alligator. *C. porosus*, the Salt-water Crocodile, has many of the characters of the common species, and ranges from India to the Fiji Islands and Australia. *C. bombifrons*, the Marsh Crocodile, often mis-called an alligator, is worshipped in Sind. Other species are the Siamese and Pondicherry Crocodiles (*C. siamensis* and *C. pondicherrianus*); the Australian Crocodile (*C. johnstoni*), with a long slender, conical snout; *C. acutus*, from Central America and the West Indies, somewhat resembling the extinct Teleosaurs in the shape of the snout; and the Cuba Crocodile (*C. rhombifer*), distinguished by its convex frontal region.

Crocoisite, an orange or red mineral, which is found chiefly in the Ural and Brazil. It forms crystals of the monoclinic system, and consists of lead chromate (PbCrO₄).

Crocus, a familiar genus of plants belonging to the Iris family, the numerous species and varieties of which are mostly natives of Southern Europe and Asia Minor. Two species, the autumn flowering *C. nudiflorus* and the spring flowering *C. vernus*, are naturalised in some parts of England. Crocuses have fleshy corms with buds on their summits; grassy leaves, enlarging after the flowering; a subterranean inferior three-chambered ovary; a long perianth tube surmounted by a funnel-shaped perianth of six nearly equal segments; three included epipetalous stamens; and a style dividing above into three dilated stigmatic lobes. The deep orange-coloured stigmas of *C. sativus* constitute saffron (q.v.). Though some flower in autumn, crocuses are specially valued in gardens as among the brightest and earliest of spring flowers. The so-called autumn crocus or meadow saffron is an entirely different plant with six stamens and a superior ovary. [COLCHICUM AUTUMNALE.]

Croesus succeeded Alyattes as King of Lydia about 578 B.C. His wealth and prosperity, followed by irretrievable disaster, served Herodotus as one

of his finest illustrations of the power of Nemesis. He made himself master of the Greek cities in Asia, and his court was visited by many learned men, including Æsop and Solon. From the latter the king heard the celebrated apophthegm, "Call no man happy before his death." Misfortune set in with the death of his favourite son by the involuntary hand of Adrastus. Then came his utter defeat by Cyrus, and his narrow escape from death at the stake, the saying of Solon, and the interference of Apollo, being the agencies that saved him. He was an honoured guest at the court of Cyrus and of his son Cambyzes for some years, though he seems to have offended the latter. Nothing is recorded as to his death.

Croft, WILLIAM, born in Warwickshire in 1677, was educated by Dr. Blow, the famous organist of the Chapel Royal. He succeeded his master in 1708, holding also a similar appointment in Westminster Abbey. In 1715 he received the degree of Mus. D. from the University of Oxford. He published a work entitled *Divine Harmony* in 1712, and his *Musica Sacra*, containing several of his anthems and his famous Burial Service, appeared in 1724. Several specimens of his church music were published after his death in 1727, and we have a few concerted pieces by him of a secular character.

Croker, JOHN WILSON, though of English blood, was born in county Galway, Ireland, in 1780, and, after receiving his education at Trinity College, Dublin, was called to the Irish bar in 1802. One or two satirical pieces from his pen attracted early notice, but in 1807 he revealed more serious aims by advocating Catholic emancipation in a pamphlet entitled *The State of Ireland, Past and Present*. Next year saw him M.P. for Downpatrick, and by judiciously defending the Duke of York in 1809 against Colonel Wardle, he secured for himself the snug post of Secretary to the Admiralty, and held it for twenty years, when he retired on a pension of £1,500 per annum. Meanwhile he continued to sit in Parliament, where he opposed the Reform Bill of 1832, and, indeed, most other progressive measures, with ability, vigour, and often with bitterness. His pen was, however, more rancorous than his tongue, and the old volumes of the *Quarterly Review*, which he helped to found, contain many fine specimens of his harsh and acrimonious style. Croker was a literary man as well as a politician, and unhappily he carried the same offensive spirit into this field, provoking severe retaliation from Macaulay and the Whigs. His edition of *Boswell's Life of Johnson*, and the matter which he collected for an edition of Pope, show industry and critical ability. He deserves praise, too, for reproducing several volumes of interesting memoirs and letters dealing with the Georgian period, for helping to establish the Athenæum Club, and for consistently supporting grants in aid of art in the House of Commons. He died at Hampton in 1857, having somewhat outlived his reputation even with his own party.

Croker, THOMAS CROFTON, born at Cork in 1798, and brought up to business, obtained, through his namesake John Wilson Croker, a clerkship in

the Admiralty. Thus provided for, he devoted himself to that particular branch of archæology in which he won his fame. In 1825 he published the *Fairy Legends of the South of Ireland*, and this was followed by *Legends of the Lakes*, *Popular Songs of Ireland*, and an original and humorous sketch called *The Adventures of Barney Mahoney*. For the Camden and Percy Societies, which he helped to found, he wrote more serious papers on the social and political state of Ireland in the latter part of the seventeenth century, and he was an active supporter of the Hakluyt, Archæological, and Antiquarian societies. He died in 1854.

Croll, DR., geologist, was born at Little Whitefield, Perthshire, in 1821. He was apprenticed to a millwright, but when twenty-four his health compelled him to leave that employment. When thirty-two he became an insurance-agent, and in 1859 he was appointed keeper of the Andersonian University and Museum at Glasgow. In 1867 he joined the Geological Survey of Scotland, from which he retired in 1881. Dr. Croll is chiefly known by his explanation of the astronomical causes of the Glacial Period (q.v.), which were expounded in his work *Climate and Time* (1875). In 1876 he was elected F.R.S., and was made LL.D. of the University of Glasgow. He died in 1890.

Croll, OSWALD, born at Welter in Hesse about the middle of the sixteenth century, became physician to Prince Philip of Anhalt, and adopting the views of Paracelsus, wrote a work, *Basilica Chemica*, of some interest to the student of history of science. He died in 1609.

Cromarty (Gael. *Crombathi*, Crooked Bay), a county and its capital in the N. of Scotland. The county was formerly split up into twenty detached portions, which were scattered about Ross-shire, and mostly in the county for administrative purposes. The name applied only to the small portion of the county between Cromarty Firth, but the name was applied to the whole county in 1698 procured the county to be divided into estates to this nucleus. The county, however, was done away with in 1875, and is now united with Ross-shire. The county is about 345 square miles. It is bounded by the E. coast. The county is the entrance to the sea.

The chief towns are Cromarty, and other boroughs, and the chief industries are fishing, cordage, and the geology of the county is of great interest.

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Society of Artists, in which Cotman, Vincent, Stark, Thistle, and Bernay Crome took a part. Among his best known pictures, none of which commanded a high price until after his death, may be mentioned *Mousehold Heath* (now in the National Gallery), *Oak at Poringland*, *The Willow*, *Coast Scene near Yarmouth*, *Bruges*, and *The Fishmarket at Boulogne*. He was successful also as an etcher. He died in 1821.

Cromer, a port and watering-place, on the N.E. coast of Norfolk, 20 miles N. of Norwich. The fine sands are attractive to bathers, and the pure, bracing air has in recent years brought many summer visitors. Owing to the encroachments of the sea the bay is dangerous for navigation, and the trade is small. (Pop. 1901, 3,776.)

Cromer, EVELYN BARING, first Earl Cromer (b. 1841), began life as an officer in the Royal Artillery. In 1872 he accompanied Lord Northbrook to India, and in 1876 left India with the rank of major, being made British Commissioner of the Egyptian Public Debt Office. When the Khedive Ismail abdicated, he was promoted to be British Controller-General. From 1880 to 1883 he was Financial Member of the Council of India. He now became British Agent and Consul-General in Egypt, and by means of his reforms and economies Egypt was enabled (1896-1898) to regain her lost possessions in the Soudan. He was raised to the peerage in 1892, and was created Earl Cromer in 1901. On his retirement from Egypt in 1907 he received a grant of £50,000.

Cromlech. [BARROW]

Crompton, SAMUEL, was born at Firwood, near Bolton-le-Moors, in 1753, and, as the son of a small farmer, was brought up to field labour. The loss of his father drove him to take work in a cotton mill, where his natural genius, aided by the elementary education he picked up in spare moments, enabled him to contrive improvements in machinery. Before 1780 he had invented the spinning mule, which revolutionised the manufacture of cotton goods and saved thousands of employers of labour. Want of means, however, compelled him to divulge his secret to persons who took advantage of him, and he scarcely reaped a benefit from his ingenuity. In his old age Parliament voted him £5,000, but this was lost in attempts to develop his business, and he died a poor man in 1827.

Cromwell, OLIVER, the second son of Henry Cromwell, of Hinchinbrook, was born at Huntingdon in 1599. He went from Huntingdon grammar school to Sidney Sussex College, Cambridge, and thence, on the death of his father in 1617, to study law in London. In 1620 he married an excellent reputation, Elizabeth, daughter of Sir James Bouchier, of Felsted, Essex, a lady of sweet and gentle disposition, who shared his troubles and survived him fourteen years. Huntingdon sent him to Parliament in 1628, and his first recorded speech was a powerful attack on the "popery" of the High Church divines. The condemnation of his cousin, John Hampden, and

interference of the Government in a work which he had at heart, viz. the completion of Bedford Level (1638), provoked him to head the opposition in his district. He became talked of as the Lord of the Fens, and in 1640 was elected to Parliament by the borough of Cambridge, his seat being retained by him a few months later on the summoning of "the Long Parliament." In 1642 hostilities broke out between the king and his people. The capture of Lowestoft, the protection of Gainsborough, and the rout of Henderson at Winceby gave him practical experience, and it was as a tried and trusted soldier that he led the left wing at Marston Moor on July 2nd, 1644. In the subsequent operations about Newbury he was hampered by the timidity of his colleague, the Earl of Manchester, whom he denounced to Parliament, with the result that "the Self-denying Ordinance" was passed, excluding all members of either House from military commands, Cromwell alone being exempted. Fairfax held the chief command, but all men looked to Cromwell as "the saviour of the nation," and after several minor successes over Rupert at Islip and Radcot Bridge, he was in June dispatched to assist Fairfax at Northampton with the rank of Lieut.-General. On the day after his arrival in camp the battle of Naseby (June 14th, 1645) decided the issue of the war, and the chief glory of that crushing victory rested with the "Ironsides" and their leader. The autumn was spent in bringing Bristol and the western counties into subjection, and at the meeting of Parliament in 1646 he was loaded with distinctions. Then followed the struggle between the Independents and the Presbyterians, representing respectively the military and the civil elements in the growing state. Cromwell's religious views and his sympathies with his trusted comrades led him to throw all his influence on their side, and in August, 1647, the army entered London in triumph. The futile negotiations with the king were now broken off by his flight from Hampton Court, and this resulted in a revival of Royalist activity, especially in Wales, where Cromwell was busily engaged in the early summer of 1648. But the most formidable movement was that in Scotland under the Duke of Hamilton, who, joined by Langdale in Yorkshire, was marching south with over 20,000 men. Cromwell hastened to the scene of danger, met the foe at Preston (August 17th), and after three days' fighting shattered the Duke's forces and took him prisoner. Following up his success with vigour, in less than two months he entered Edinburgh, received the adherence of the Scots, and was on his way home again. In the solemn proceedings of the High Court of Justice and the terrible event that resulted therefrom he bore a large share, his name standing third on the Royal death-warrant. The rising of the Levellers was next repressed by his heavy hand, and in August, with the title of Lord-Lieutenant, he left for Ireland to face the powerful organisation under Ormonde. Nine months of ruthless but judicious severity not only reduced the country to submission, but marvellously restored its material prosperity,

and in May he was once more in London prepared to take command of the operations against the Scottish Covenanters with whom Charles II. had concluded a concordat. For some weeks he manœuvred against Leslie, till, obliged to fall back upon Dunbar, he was attacked in a disadvantageous position. But the courage and discipline of his veterans was not to be gainsaid, and between dawn and breakfast the Scots were routed like chaff before the wind. Remaining in Scotland during the winter, he passed with the summer into Fife and pushed on to Perth, which surrendered. Charles at this juncture played a bold stroke by advancing into England. Cromwell followed with all rapidity, gathering men as he went. He overtook the king at Worcester on September 3rd, 1651, and destroyed the last remnant of the Royalist army by "the crowning mercy" of that bloody day. The victor once more entered London in triumph, and was for a year engaged in consolidating the Commonwealth, passing the Act of Amnesty, reducing the army, and arranging for the dissolution of Parliament and the re-election. Hostilities by sea had broken out, too, with the Dutch, and were not brought to an end until Blake's great victory in February, 1653. Meanwhile, Parliament was showing some disinclination to decree its own "happy despatch," so on April 20th Cromwell marched into the House attended by a party of soldiers, and dissolved the assemblage abruptly. After more or less effectual attempts to tinker up the Constitution, Cromwell was appointed Lord Protector, empowered, with the assistance of a Council of State, to perform all the functions of Government until a Parliament should be duly elected. Parliament was, however, indisposed to accept the new Constitution without a struggle, the Republican members offering most strenuous opposition to the Protector's authority. After five months of wrangling, Cromwell dissolved it in January, 1655, and for nearly two years ruled absolutely. In 1656 the new Parliament assembled, and agreed, after some debate, on a constitution which embraced two Houses and a king, if Cromwell were willing to accept the title, but after weighing the advantages and disadvantages he refused this honour. More than one attempt on the Protector's life was detected during this period, and Lambert, his old lieutenant, fomented rebellion amongst the troops. A dissolution ensued early in 1657, and Cromwell resumed the heavy burden of despotism. He was cheered for the moment by seeing his alliance with France end in the humbling of Spain and the capture of Dunkirk, but a little later the fatal illness of his favourite daughter, Elizabeth Lady Claypole, shattered his already failing health. He expired on September 3rd, 1658. It may safely be said that in spiritual and moral qualities, in disinterested patriotism, and in capacity as a soldier and administrator, he compares very favourably with any monarch who has occupied the British throne. In 1900 a biography by John Morley was published.

Cromwell, RICHARD, the third son of the foregoing, was born at Huntingdon in 1626,

Cromwell, THOMAS, Earl of Essex, alleged to have been the son of a blacksmith, was born at Putney in 1490. His youth was spent abroad in commercial pursuits, and on his return he entered Wolsey's service, remaining faithful to him to the end, but having, according to some observers, a keen eye to his own interests. Before his protector's death he won the favour of the king by judiciously setting forth his plan for detaching the English Church from the control of the Papal See. Henry found him a zealous and unscrupulous agent in the promotion of the divorce and the suppression of the monasteries, and he heaped upon him offices and rewards, finally raising him to the peerage as Earl of Essex, and giving him the Garter. During seven years he wielded his power free hand, and his rapacity and ambition were exercised without restraint. His policy was based on Protestantism, not from any religious conviction, but in breaking the tie with Rome, for other reasons, but partly also to strengthen his position, he involved himself in quarrels with the German Courts and the Emperor, and married Anne of Cleves. His fall was caused by his ill-doing. His fall was followed by the Duke of Norfolk accused him of treason, and he was condemned by a bill of attainder, and executed, 1540.

NAME	ADDRESS	CITY	STATE	ZIP
ALAN	12345	NEW YORK	NY	10001
BOB	67890	LOS ANGELES	CA	90001
CHARLIE	11111	CHICAGO	IL	60601
DAVE	22222	HOUSTON	TX	77001
EVE	33333	PHOENIX	AZ	85001
FRANK	44444	SEATTLE	WA	98101
GRACE	55555	DALLAS	TX	75201
HELEN	66666	PORTLAND	OR	97201
IRVING	77777	INDIANAPOLIS	IN	46201
JACK	88888	COLUMBIA	SC	29201
JANE	99999	MEMPHIS	TN	38101
JOHN	10101	BOSTON	MA	02101
KAREN	20202	MINNEAPOLIS	MN	55401
LARRY	30303	ATLANTA	GA	30301
MARY	40404	DETROIT	MI	48201
MIKE	50505	PHILADELPHIA	PA	19101
NANCY	60606	ST. LOUIS	MO	63101
OTIS	70707	NEW ORLEANS	LA	70101
PAT	80808	DENVER	CO	80201
RAY	90909	SAN FRANCISCO	CA	94101
SAM	01010	WASHINGTON	DC	20001
TOM	12121	SPRINGFIELD	IL	62701
WILLIAM	23232	ALBUQUERQUE	NM	87101
YVONNE	34343	EL PASO	TX	79901
ZOE	45454	FAIRFAX	VA	22031

1. The first step is to identify the problem. In this case, the problem is that the company is not meeting its sales targets.

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Crops, ROTATION OF, a principle of agricultural practice depending on the fact that the growth of one kind of plants, year after year, and the removal either of the entire produce or of the ripened fruit, rapidly impairs the general fertility of the soil. It is necessary, therefore, so to alternate different crops as to give the land an opportunity of acquiring fresh available supplies of those of its chemical constituents which have been removed in any crop before growing that crop up.

it a second time. This replacement of waste may be effected by manuring, or by ploughing or digging in certain things, such as stubble or haulm, or by fallowing; but is most economically effected by rotation of crops. Whilst land is lying fallow, *i.e.* without a crop, or is under some other crop, rain, frost, sun, wind, dust, and worms either bring new matter to it, or loosen, pulverise, dissolve, or otherwise change substances in it, so as to render them available for the plant. It is usual to alternate grain crops and green crops, and, though the special circumstance of each soil and farm must be considered, what is known as the four-field or Norfolk system is generally adopted, by which turnips are followed by barley, barley half by clover and half by beans, peas, potatoes or vetches, and these by wheat or oats. Italian rye-grass may be substituted for clover, and at the next rotation the clover is sown on the half on which it was not before, so that clover comes only once in eight years on the same land. Similarly turnips may be replaced by mangel, carrots, cabbages, or swedes.

Croquet, connected with the idea of *hook*, though it is doubtful whether this idea has reference to the mallet or to the hoops through which the ball is driven, is a game which was much in vogue a few years ago, but in England, at least, has almost disappeared before the game of lawn-tennis. The game is played by two or more persons, generally arranged in equal parties, whose object it is to drive each one a wooden ball from a starting-peg through a series of iron hoops of varying position and arrangement to another peg, and then back through some of the same and other hoops to the starting-peg, the first party winning whose balls all strike the starting-peg on the backward journey. The players take their turns in the order of certain coloured rings painted upon the pegs, each ring corresponding in colour with one of the balls. A player on passing through a hoop has a further turn, so, too, upon striking another ball, which he is allowed to further drive away by a blow upon his own ball placed in contact with that which he has struck, hindering it if it be an adversary's, helping it on if it is a friend's. After passing the last hoop on the home journey a player becomes a "rover," and may roam over the ground aiding his friends and damaging the foe, whose object it becomes to drive a rover, if not the last of the side, against the peg and so end his roving life. The game was revived in a modified, or rather adapted, form, towards the end of the 19th century and showed signs of once more taking its position in popular favour. It never, however, regained the position it once held, owing, no doubt, to the lack of exercise it afforded.

Crosier (written also CROZIER), a staff carried before bishops and other great ecclesiastical dignitaries, the same as the pastoral staff. It is topped by a more or less ornamented crook to indicate the bishop's pastoral authority over his flock. The cross upon the patriarch's crosier has two transverse bars, that upon the pope's crosier has three such bars.

Cross, generally consisting of a vertical limb crossed by a horizontal one, was an instrument of punishment formerly used as a means of inflicting what was an undignified and degrading death. By its employment as the Saviour's death-instrument it was elevated into a position of respect and regard among most Christian bodies. Other races than Christian have attached a symbolism to the Cross, and have respected it. The most usual forms of cross are (1) the Latin Cross, in which the cross-bar is near the top of the upright; (2) the Greek Cross (called also St. George's), in which the limbs cross at the centre and are of equal length; (3) St. Anthony's Cross, which resembles the Greek letter T; (4) St. Andrew's Cross, shaped thus X; (5) the Maltese or eight-pointed cross; but there are many other varieties, both in ecclesiastical and heraldic and ornamental use. The many market-crosses, preaching-crosses, village-crosses, and monumental-crosses scattered about the world have in some countries suffered much through sectarian zeal. The crosses in memory of good Queen Eleanor plead for preservation to the sentimental side of human nature, and have met with some consideration. The Fiery Cross of the Scottish Highlands has been made familiar to us by Scott, astronomy has its Southern Cross, and orders of knighthood have their Grand Cross. The Invention of the Cross, *i.e.* its discovery in 326 A.D. by St. Helena, is commemorated on the 3rd of May. The word is also used metaphorically to denote trial or trouble. As a verb, the word signifies ecclesiastically to sign with the sign of the cross. Alice Brand in the ballad crossed the dwarf Urgan once, twice, and thrice before he resumed his original shape as her brother.

Crossbill, any species of the Passerine genus *Loxia*, in which the lower mandible curves upwards to the right or left of the upper mandible. Buffon described this formation as an "error of nature": it is an excellent adaptation of means to an end—to enable these birds to break up the fruits of conifers to obtain the seeds, on which they feed, and it is also used as a climbing organ. The Common Crossbill (*Loxia curvirostris*) is from six inches to seven inches long; the young males are greenish-brown, with an olive tinge, and speckled with dark brown; after the first month a red tinge is acquired, and after the second the plumage becomes olive brown, washed with greenish-yellow on the back. It is a somewhat irregular British visitant, frequently staying to breed. *L. pityopsittacus* (the Parrot Crossbill) and *L. bifasciata* (the Two-barred Crossbill) more rarely occur. All the Crossbills are gregarious, and frequent pine-forests in the northern hemisphere.

Cross Bow was a bow fixed upon a stock, and the string in its rebound struck a small bolt, arrow, or quarrel, a trigger holding the bow at its required tension till the moment of discharge. The bolt sometimes passed along a groove, sometimes along a barrel. The cross-bow was a formidable weapon of mediæval warfare, and was sometimes of such strength that mechanical contrivances were required to bend it. Pollaiuolo's picture in the National Gallery of the

Martyrdom of St. Sebastian presents some striking examples of handling the cross-bow. The *arbalest* or *arbalète* was a favourite weapon of the Low Countries, and its memory is kept green by the Jardin des Arbalétriers at Antwerp, while in the neighbourhood of that town the weapon is still used in competitions, and examples of it may be seen in which a small steel bow is fitted to a polished stock closely resembling that of a gun or rifle.

Cross Buns are buns marked with a cross, and largely eaten in England upon Good Friday. The custom of marking certain days by certain kinds of food was once widely prevalent and is still alive; for instance, furnety at Christmas, spiced ale on Mothering Sunday, simnel cake and custards, called pudding-pies in some parts, each at its special time.

Crosse, ANDREW, was born near Taunton in 1784, and inherited a considerable landed estate. He devoted himself to the study of the formation of crystals under voltaic electricity, and gave the results of his labour to the British Association in 1836. He is said to have early predicted the invention of the electric telegraph. His alleged production of acari by the electric current led to a long and acrimonious discussion, and brought him into scientific disrepute. He died in 1855.

Crossley, JAMES, F.S.A., was born at Halifax, Yorkshire, in 1800; and educated for the law, which he practised until 1860. He contributed articles on antiquarian and literary subjects to *Blackwood*, *The Retrospective Review*, and *The Quarterly*, and was a friend of Charles Lamb. Various societies, such as the Philobiblon, the Chetham, and the Spenser, owed much to his exertions. He collected a large and curious library. He died in 1883.

Cross-pollin

Crotalidæ.

Crotch, Wm. was born at Norwich in 17 for music almost in his in appointed professor of mu became principal of the He was a voluminous o and piano-forte, and wrote of *Music of All Ages*. The works were *Palestine*, an o *Snowdon Calls*. He died

Croton a city of 710 B.C., at coast of Crotona, an ancient city Under the inhabitants (510 B.C.). obtained the monarchy that was estab- Minæon was an early and

Rhegians, the Crotoniates maintained their independence, and remained neutral during the Athenian invasion of Sicily. Though occasionally subject to Syracuse, the city on the whole maintained its autonomy against aggressors until the second Punic war, when the shelter it afforded to Hannibal led to its ruin. The Byzantine emperors held it until it passed into the hands of the Normans. The famous temple of Lacinian Juno containing the *Helen* of Zeuxis was in its vicinity. The modern town is about a mile from the old site.

Croton Oil is expressed from the seeds of *Croton Tiglium*, a small euphorbiaceous tree native to the Malabar coast, in which it occurs to the extent of 50 to 60 per cent. The tree has scattered oval-oblong acuminate leaves and greenish monœcious flowers, the male having five petals and ten to fifteen stamens, whilst the female are apetalous and three-styled. The three carpels each contain one seed about half-an-inch long, $\frac{2}{3}$ inch broad, of a cinnamon brown colour. The oil is transparent, viscid, pale yellow or brownish, acrid, fetid, and acid, soluble in ether, and slightly so in alcohol. It contains acetic, butyric, valeric and tiglic acids. The oil prepared in England is preferred, and the seeds are imported from Bombay and Cochin. The oil is adulterated with olive, castor, and nut oil. *Croton Eleutheria* yields Cascarilla bark, and *C. pseudo-China* the Mexican Copalche bark. The plants known as *C. pictum*, *C. variegatum*, etc., cultivated for their foliage, which is crisped and mottled with red, orange or yellow, belong truly to *Codiaeum pictum*, a species of a genus differing from *Croton* in the indefinite number of its stamens. Croton oil acts as a powerful irritant to the skin. It used to be not infrequently employed in the form of linimentum crotonis to inflamed joints. Its use is now practically superseded by other forms of counter-irritants. Administered internally, croton oil is a very powerful purgative, which should never be given, save under professional advice.

Crotophaga, a genus of American cuckoos, with three species, ranging from Brazil to the Antilles and Pennsylvania. They are social in habit, and one nest is said to serve many pairs. They feed on the larvæ of insects that infest cattle. The best known species is *C. ani*, the Savannah Blackbird (q.v.).

Croup, a term derived from an Anglo-Saxon word, signifying *to cry out*. The word croup was apparently employed for many centuries in Scotland to a certain kind of cough associated with disease of the larynx in children. Thus, the term croup originally referred to a symptom of disease. About the middle of the 18th century an attempt was made to associate the word not with a symptom, but with an actual form of disease. The croupy cough was found in some instances to be caused by the presence of membranous exudation in [the larynx, and it was considered desirable to designate such a condition of things by a specific term, viz. croup. Meanwhile the pathology of diphtheria was worked out by a French physician, Bretonneau, and

it became obvious that many cases of membranous laryngitis were of diphtheritic origin. The question arose—were the terms diphtheritic laryngitis as employed by Bretonneau, and croup as understood by the Scottish physicians, co-extensive, or were they to be considered as descriptive of entirely distinct forms of disease? For many years it was the fashion to distinguish between croupous and diphtheritic inflammation, and much controversy and much confusion resulted. The question cannot yet be held to be finally settled, but the tendency at present seems to be to restore to the term croup its original signification, and to consider it to denote a set of symptoms and not a species of disease. The character of the croupy cough can only be grasped by actual experience; no amount of description will do justice to it. Mothers are apt to apply the term croupy in a very indiscriminate manner. True croup is a symptom of grave significance; it is only produced by involvement of the larynx; and laryngeal disease in young children is no trifling matter. Croup particularly affects children between two and five years of age; it is said to occur with special frequency in cold and damp situations; it not unfrequently accompanies the onset of measles, and certainly in many instances it is caused by the specific poison of diphtheria. Unfortunately in many patients the history is one of rapid progress from bad to worse, of increasing difficulty in breathing, and finally of death by suffocation. Hence the advisability of procuring professional advice from the outset. In some of the gravest cases *tracheotomy* (q.v.) has proved the means of saving the patient's life. Spasmodic croup, false croup, or *laryngismus stridulus*, is a distinct affection met with in young babies from six months to two years old. The subjects of this disease are almost always boys, and they usually present symptoms of rickets. The seizures only last a few seconds, but they are apt to recur, and may prove fatal. *Laryngismus stridulus* is allied to epilepsy, and is usually associated with carpedal contractions.

Crow, a book-name for the genus *Corvus*, with over fifty species, the type of the Passerine family Corvidæ, universally distributed, except in South America and New Zealand, and reaching to the extreme north of Europe and Asia. The beak is hard, stout, compressed, and sharp at the edges; nostrils at its base, and generally hidden by stiff feathers directed forwards; wings long and graduated; tail more or less graduated; feet and claws strong, the latter curved and sharp. Four, or according to some authorities, five species are British. Three of these—the Raven (*C. corax*), the Rook (*C. frugilegus*), and the Jackdaw (*C. monedula*) are treated separately. The Black or Carrion Crow (*C. corone*) is from eighteen to twenty inches long, and has the whole plumage black, glossed above with metallic reflections, varying from violet to green, according to the light. In the Grey, Hooded, or Royston Crow (to which specific rank, as *C. cornix*, is sometimes given), about the same size as the Black Crow, the nape, back, rump, and most of the under surface are smoky grey. The

bill, legs, and toes, are black in both. Professor Newton, after carefully examining the evidence for both views, has come to the conclusion "that no specific distinction can be maintained" between these two forms. The chief arguments in favour of this conclusion are the interbreeding of the two forms, and the frequent occurrence of black and grey birds in the same nest. The principal food of these birds is carrion, but nothing of an animal nature comes amiss to them, from a dead sheep to insect larvæ. Macgillivray notes that they sometimes feed on crustaceans, molluscs, and worms, and occasionally on grain. They are the natural enemies of game-keepers, for they devour game eggs, young birds, and leverets, and, as a consequence, are shot and trapped without mercy. It should, however, be remembered in their favour that they destroy large numbers of mice and insects. *C. americanus*, the American Crow, is a smaller form, and feeds largely on grain. *C. ossifragus*, the Fish Crow, also American, is a coast bird. *C. splendens*, the Indian grey-necked Crow, though useful as a scavenger, is as mischievous and thievish as a magpie. *C. capellana*, from the Persian Gulf, is closely allied to the Hooded Crow. [CHOUGH, JAY, MAGPIE.]

Crowe, EYRE EVANS, born at Redbridge, Hants, in 1799, and educated at Trinity College, Dublin, adopted the profession of literature, and wrote for the *Morning Chronicle*, *Examiner*, *Blackwood*, and *Lardner's Encyclopædia*, later on becoming editor of the *Daily News*. Foreign politics and history were his strong points. Besides many ephemeral productions he published *Lives of Foreign Statesmen*, *The Greek and the Turk*, *The Reigns of Louis XVIII. and Charles X.*, and a *History of France*, the last being ranked as a standard work. He died in 1868. His son, Sir J. A. Crowe, C.B., K.C.M.G., is a distinguished authority on Italian art and commercial treaties.

Crowfoot, the popular name, derived from the deeply-divided leaves, of many species of *Ranunculus* (q.v.). As our terrestrial, yellow-flowered forms are now generally known as buttercups (q.v.), the name crowfoot is especially retained for the white-flowered aquatic species, the sub-genus *Batrachium*, or water-crowfoots. These commonly have leaves either broad, slightly lobed, and floating, or much divided into linear segments and submerged, in neither case resembling "crow-toes," as Shakspeare has it.

Crowland, or CROYLAND, an ancient town at the confluence of the river Welland and Catwater Drain in Lincolnshire, 8 miles from Peterborough. The bridge connecting the principal streets is one of the most remarkable specimens of Saxon architecture. A famous abbey was founded here in 714 on the site of an earlier hermitage. It was twice burnt by the Danes and twice restored, the ruins existing at the present day. The historian Ingulphus was one of its abbots. Pop. (1901), 7,047.

Crown (Lat. *corona*) is a root existing in many languages, and signified at first an ornament for the head, such as the poet's "coronals." It was

then adopted as a mark of special honour, as the civic and mural crowns of the Romans, and the victor's laurel of the Greeks. Finally, it became one of the special symbols of sovereignty, and heraldry introduced a certain uniformity in its shape, so that its form might show the rank of the wearer. The State crown made in 1838 for Queen Victoria is elaborate and highly ornamental; the crowns of Austria, France, and Russia have their distinctive features—that of Austria much resembling a mitre. The word is also much used metaphorically and technically—the martyr's crown, a sorrow's crown of sorrows, the crown of an arch, of the head, of a tooth.

Crown, CLERK OF THE, the principal official of the Crown Office in Chancery (now the Chancery Division of the High Court of Justice). He is an officer of Parliament and of the Lord Chancellor in his non-judicial capacity, rather than an officer of the Courts of Law. He makes out and issues summonses for the election of members to both Houses of Parliament; he has the custody of the poll-books and ballot-papers; and upon the meeting of a new Parliament he delivers to the Clerk of the House of Commons a list of the names of members returned to serve in that Parliament, after which the Commons go up to the House of Lords, and the Lord Chancellor addresses them generally upon the object and purpose of their being summoned to Parliament. The Clerk of the Crown also reads the titles of bills at the time the Royal assent is signified to them by commission. Nearly all patents passing the Great Seal, except those for inventions, are made out in his office, and he makes out the warrants for almost all letters-patent under the Great Seal. He also performs the duties formerly attached to the Clerkship of the Hanaper. He is Registrar of the Lord Chancellor's Court. [PATENT.]

Crown ? *Imperialis*), a stately, old-perennial bulbous plant with numerous aërial stem, from beneath which flowers. The flowers are red or a clear nectariferous.

Crown-piece in the value of 5s. It is now revived. The obverse, but formerly there was introduced by James I.; and the sovereign on Edward VII. as the obverse, while the representation of the genus [CRANE.] The cranes, and radiating from

the top of the head. *B. pavonina* is the West African Crowned Crane, and *B. chrysopelargus* the Kaffir Crane.

Crows, properly *Upsarokas*, prairie Indians, usually grouped with the Dacotahs, forming with the Minnetarees the Upper Missouri division; but by some authorities regarded as an aberrant branch of the Shoshone (Snake) family. Formerly roamed the Yellowstone Valley and the region thence westwards to the Rocky Mountains; three divisions, Kikastas, Ahnahaways, and Allakaweahs.

Crowther, THE RIGHT REVEREND SAMUEL ADJAI, D.D., Bishop of the Niger Territory, a native of Africa, was born at Ochugu, in the Yoruba country about 1810. In 1821 he was captured by slave dealers, and shipped for a foreign mart, but an English cruiser restored him to liberty, landing him at Sierra Leone. Here he was baptised in 1825, and named after the then Vicar of Christ Church, Newgate Street. After receiving a fair education, he acted for several years as a teacher, and in 1841 joined the first Niger expedition. In 1842 he came to London, was trained at the Missionary College, Islington, and ordained in 1843. For twenty years he laboured assiduously in Africa, taking part in the Niger expedition of 1854, and writing an excellent account of its progress. He also translated the Bible into the Yoruba dialect, and wrote many works for the enlightenment of his heathen compatriots, besides making several interesting contributions to geographical science. In 1864 he was appointed the first Bishop of the Niger Territory, and until his death in December, 1891, discharged the duties of his post in such a way as to merit the highest approbation. He was a vigorous, kind-hearted, intelligent man.

Croydon, a town in Surrey on the river Wandle, 9 miles from London. The Roman Noviomagus was in its immediate vicinity, and the name Croindone occurs in Domesday Book. Many Roman relics have been found here, and there are traces of a British camp near Addington Park. Lanfranc held the manor of Croydon, and built an archiepiscopal palace, which was kept up until 1750. Parts of the building still remain. The streets are well laid out, and many handsome villas have sprung up in the district owing to railway facilities, there being seven stations. There is a handsome modern church and the usual public edifices. The Surrey summer assizes are held at Croydon alternately with Guildford. (Pop. 1901, 133,885.)

Crucibles are vessels employed for exposing substances to high temperature, either for purposes of fusion, or to induce some chemical or physical change. They should, therefore, be capable of withstanding great heat and changes of temperature, and should also be unaffected upon by the fuel, or the substances heated. Clay crucibles are made of very refractory fire-clays, or mixtures of clay and sand, and various sands, as Hessian, Cornish, London, Stourbridge, etc., are used in assaying and metallurgy. Porcelain and platinum crucibles are indispensable to the chemist in quantitative analysis. Silver, nickel, iron, plumbago, and lime

crucibles are also each used in special operations for which the other materials would be unsuitable.

Cruciferae, a large family of thalamifloral dicotyledonous plants, mostly herbs with watery juice which is often pungent or even acrid, though never poisonous. They have generally simple, scattered, exstipulate leaves, and yellow, white, or rarely red flowers arranged in ebracteate and often corymbose racemes. There are two pairs of sepals to each flower, the outer pair antero-posterior, the inner ones often pouched at the base. The four diagonally-arranged hypogynous petals being arranged like a cross, give its name to the order, which, however, corresponds almost exactly with Linnæus's fifteenth class, the *Tetradynamia*, so called on account of the stamens being tetradynamous—six in number, that is, the two outer or lateral ones shorter, the four inner ones being longer. These four long stamens apparently represent two antero-posterior stamens, which at an early stage undergo branching or collateral chorisis (q.v.). There are two carpels, which are united into a dry pod-like fruit known as a *siliqua* (q.v.). It is two-chambered, owing to the formation of a septum by the ingrowth of the carpels from their parietal placentas. The fruit is often compressed, either in the direction of this septum or at right angles to it, and is sometimes shortened, when it is termed a *silicle*. The seeds are generally small, and are exalbuminous, the order being divided into tribes in accordance with the various ways in which the cotyledons (q.v.) are folded with reference to the radicle. The order includes the genus *Brassica* (q.v.), the cabbages and mustards, sea-kale, cresses (q.v.), radishes, stocks, wallflowers, rockets, and woad. Many plants belonging to it have oily seeds, as the rape and the mustard, for example.

Crucifix (Lat. *crucifigere*), a cross bearing the figure of Christ crucified. Its use appears to have been introduced about the 9th century, and no instance of it has been found in the catacombs, nor is it alluded to by any writer of the first four centuries. The crucifix is in use in most Christian churches, though many of the Reformers and their followers have abandoned its use except in sculpture. Some crucifixes had a figure clothed and with eyes open as alive, but in most cases the body, clothed only with a girdle about the loins, has the appearance of death. The figure on the Jansenist crucifix has the arms hanging down instead of extended upon the transverse limbs of the cross.

Cruden, ALEXANDER, born at Aberdeen in 1701, and educated for the Church at Marischal College, became insane owing to a disappointment in love. Coming to London he started as a bookseller in 1732 near the Royal Exchange, and in 1737 produced his *Concordance* to the Bible, which was dedicated to Queen Caroline. He was several times confined as a lunatic, and conceiving himself to be divinely commissioned to reform moral abuses, he assumed the title of "Alexander the Corrector," under which disguise he wrote some curious memoirs. He died in 1770.

Cruikshank, GEORGE, the son of an artist, was born in London in 1792, and began before manhood to draw and etch illustrations for children's books. In association with William Hone he produced a long series of political and social caricatures, marked by a certain sense of humour and much grotesque power. He illustrated Fielding, Smollett, Scott, Harrison Ainsworth, and many other authors, besides contributing thousands of drawings to current periodicals. The most characteristic specimens of his style are to be found in the original editions of Dickens's *Oliver Twist*, *Nicholas Nickleby*, and *Sketches by Boz*. Later in life he devoted his genius to the cause of temperance, and brought out the plates so well known as *The Bottle*, painting also in oils *The Worship of Bacchus*, which he presented to the nation. His personal character was almost as eccentric and as vigorous as his artistic creations. He died in 1878, and was buried in St. Paul's Cathedral.

Crusades, wars, sometimes degenerating into mere marauding expeditions, undertaken in the Middle Ages at different periods for rescuing the Holy Land and its sacred places from heathen hands. The first, in consequence of Peter the Hermit's preaching, was headed by Godfrey de Bouillon in 1096; the second was preached by St. Bernard in 1147; the third, in 1189, had among its members Richard of England, Philip Augustus of France, and Leopold of Austria; the fourth, in 1202, led to the founding of a Latin empire in the East by Baldwin of Flanders; the fifth, in 1228, was commanded by Frederick II.; and the sixth and seventh, in 1248 and 1270, were under St. Louis IX. of France. However they may be condemned, the crusades led to trade and intercourse between East and West, and those who took part in them at least pursued a lofty ideal. The word is also used metaphorically of an attack upon an abuse.

Crustacea, the largest class of the phylum Articulata, including the Crabs, Lobsters, Shrimps, Barnacles, Water Fleas, Sand Hoppers, etc. They are mostly aquatic, and breathe by gills or the general surface of the body. They have two pairs of antennæ or feelers, both of which obtain their nerves from the mass above the œsophagus known as the brain (a "syncerebrum"). The thorax (the middle division of the body) is more or less united to the head, and carries a series of jointed limbs; the abdomen is usually also segmented and limb-bearing. The external form varies greatly; segmentation is usually well marked, but in one or two groups, such as the Ostracods, it is never seen, and in others it is rudimentary. Most Crustacea are, however, composed of a series of more or less similar segments; they are typically cylindrical or depressed rings bearing at the lower margins a pair of jointed appendages. The number of segments varies greatly; in the higher orders, such as the Decapods, the number is fixed at twenty (five in the head, eight in the thorax, and seven in the abdomen) as in Crayfish (q.v.); in these the appendages are altered into feelers, jaws, claws, walking limbs, accessory sexual organs, and swimming structures. In other orders the number of segments may be

much greater; thus, it is over sixty in *Apus*, a form common in fresh water in Northern Europe. Externally the Crustacea are nearly always protected by a hard outer crust, which is usually periodically thrown off (ecdysis). The appendages are always jointed and consist of a basal joint (or propodite) and two branches, the exo- and endopodites; in the first antenna and in the Ostracods there is typically only one branch. In *Apus* there is more than one pair of appendages on each of the hinder segments of the thorax. Respiration is mostly by branchiæ or gills, but it is cutaneous or effected by the general surface of the body in the Copepods and Barnacles; it is also rectal in the Phyllopods, Cladocera, Crayfish, etc., water being periodically admitted to and forced from the anus. The body cavity (q.v.) usually is of the type known as a "pseudocœle" or false cœlome, but in the Prawns there is a large true cœlome or "archicœle" (q.v.). The eyes are simple or compound; there is usually one pair but may be more, or there may be one unpaired median eye. In some of the deep sea Crustacea, such as the Euphasidæ, there are also scattered structures which are either eyes or luminous organs at the bases of the gills and limbs. There are many cases of degeneration in the Crustacea; thus the subterranean forms have lost their eyes. Parasites, e.g. the *Rhizocephala*, have lost the mouth and digestive apparatus; the most striking case is that of the complemental males of the Cirripedia, small dwarf forms, which live only to fertilise the female. Development is very seldom direct, and there is usually a well-marked metamorphosis; most of the Entomostraca are hatched into the Nauplius (q.v.) form; most of the Decapoda commence life as Zocæa (q.v.), but a few, such as the *Stomatopoda*, have a Nauplius stage. The Crustacea are divided into two sub-classes—the Entomostraca and the Malacostraca (q.v.). The Entomostraca are all small simple forms, with few segments. This includes the Phyllopoda (q.v.), e.g. the Fairy Shrimps, etc.; the Ostracoda (q.v.), e.g. the Fairy Shrimps, etc.; the Copepoda (q.v.), e.g. the Copepods, etc.; the Cirripedia (q.v.), e.g. the Barnacles, etc. The Malacostraca have many segments and are divided into three groups—(1) the Leptostraca, including the genus *Neobalia*; (2) the Amphipoda, including the genus *Amphipoda*; and (3) the Thoracostraca, including the Cumacea, the Squilla, and the Decapoda (q.v.), etc. The Malacostraca are the most interesting group, including the Prawns, etc. The Crustacea are widely distributed, but the Amphipoda (q.v.) live in salt lakes and marshes; the Decapoda are terrestrial and are found in the Cambrian and Silurian. The Trilobites are the Arachnida.

Crutched Friars, an order of Friars who gained this name in England from the cross which they wore upon their dress. They seem to have appeared in England in the 13th century, and had houses in London (where the name still survives), in Oxford, and in Reigate.

Cryolite, a white or brownish translucent mineral, which is found in Greenland. It consists of the double fluorides of sodium and aluminium (Na_2AlF_6). It has a specific gravity of about 3, and is very easily fusible. It is largely employed in the manufacture of soda, alum, and aluminium, and of a white porcelain-like glass.

Cryophorus (Gk. *kruos*, cold; *pherein*, to carry), in practical physics, is a glass tube with a bulb blown at each end, containing a small amount of water, the rest of the space being occupied by water vapour alone. If the water be confined to one bulb and the other be placed in a freezing mixture, the water vapour is condensed; evaporation takes place at the surface of the liquid; heat is by this process abstracted from the liquid, which may thus be made to freeze without actual contact with the freezing machine. [EVAPORATION.]

Crypt (Gk. *kruptein*, to hide) originally denoted a den or other secret place. The name then came to be applied, especially in an ecclesiastical sense, to the vaulted part beneath a church or cathedral, especially below the choir, where sometimes the body or relics of a saint were preserved, a custom which seems to have arisen from the practice of building churches above the graves of martyrs and saints. The crypt beneath Canterbury Cathedral is famous and extensive, and that beneath St. Paul's Cathedral is well known. There is a notable crypt beneath the choir of St. Hubert's Abbey at the town of that name in Belgium. The name is also used in anatomy.

Cryptogamia, the name of the twenty-fourth class of the Linnæan classification of plants, implying that in them the process of fertilisation is obscure, is still generally and conveniently employed as a collective name for the three lower sub-kingdoms of the plant world, the Thallophyta, Bryophyta, and Pteridophyta. These plants differ much among themselves in essentials of structure, especially in their vegetative organs, and it is difficult to state positive characters in which they agree. Thus the Thallophytes (algæ and fungi) are entirely composed of cellular tissue, generally consist of a *thallus*, without distinction of stem and leaf, and in many cases possess no process of sexual reproduction. In Bryophytes (mosses and liverworts) and Pteridophytes (ferns, horse-tails, and club-mosses) there is a great contrast in the character of the alternation of generations (q.v.), but there is generally a distinction of stem and leaf, and the two groups agree with one another, and with some of the higher Thallophytes, in having a motile antherozoid (q.v.) as the male element in a sexual process, and in the formation in most cases of minute separable asexual reproductive bodies known as *spores* or *gonidia*. From higher plants Cryptogamia are

popularly separated as "Flowerless plants," having as a rule no conspicuous clusters of specially modified leaves (perianth) surrounding their spore-bearing leaves or sporophylls, whilst these last but slightly resemble the stamens and carpels of the group called in contradistinction *Phanerogamia* (q.v.) or Flowering plants. More real distinctions consist in the absence of motile antherozoids in these latter plants and in the formation of that complex reproductive body, the seed, from producing which phanerogams are now termed "spermatophytes." As distinguished from the *Thallophytes* or *Thallogens*, *Bryophytes* and *Pteridophytes* are sometimes termed *Acrogens*, having stems growing mainly at their apex, whilst *Phanerogams* were formerly divided into *Endogens* and *Exogens* (q.v.). Again, as distinguished from *Dicotyledones* and *Monocotyledones*, *Cryptogams* were once termed *Acotyledones*, an inaccurate term, since, though not forming any true homologue of a separable seed with its various coats, the higher *Cryptogams* do form an embryo with cotyledons, radicle and plumule. Though abandoned by the philosophical student of plant structure, the term *Cryptogamia* is likely to be long retained in general use, even among botanists, as a convenient term for these three lower sub-kingdoms. Here, however, it is far easier to describe the characteristics of these groups under their separate headings than to state characters common to them all.

Cryptogamic Plants. [CRYPTOGAMIA.]

Cryptography, as the name denotes, signifies *secret writing*. At all times since the introduction of writing there have been occasions when men, for one reason or another, have desired to make communications which should be unintelligible if they fell into hostile or curious hands. The Spartan ephors wound a piece of paper, or its equivalent, spirally round a staff and wrote along the line of the staff. When unrolled this strip carried no connected intelligence, but became legible when rolled round a similar stick in the possession of the recipient. Bacon set great store by cipher, and Charles I. and his queen largely employed it in their correspondence. Pepys's diary is in cipher. Many ingenious systems of cipher have been invented, from the simple substitution of one letter of the alphabet for another, well known to every schoolboy, to the employment of an elaborately changing series of symbols, which present greater difficulties, but not insuperable ones, to a would-be decipherer, provided the writing is of some length. Many people use a secret writing of their own in making entries in their diary. If the same symbol always represents the same letter, deciphering is comparatively easy. How to set about reading a cipher is interestingly set forth in Edgar Allan Poe's tale, *The Gold Beetle*. A cipher which presents much difficulty is that where two persons who have each a copy of a certain edition of a book, refer to such a number of letters on such a line, on such a page; but the writing and reading are both tedious processes. The modern telegraph codes used by commercial houses are the most usual kind of secret-writing to be met with nowadays.

Cryptomeria, a genus of *Coniferae*, belonging to the sub-order *Taxodineae*, and native to Japan. Its leaves are short, linear, and rigid, crowded and spreading. The flowers are monocious, the male ones having peltate stamens each with five pollen-sacs at its base, and the small globular female cones having four to six winged seeds in the axil of each scale. *Cryptomeria* is hardy and often reaches a large size in English pinetums.

Cryptozonata, that order of Starfishes which includes all those in which the marginal plates are small and inconspicuous, as in the "Common Sand Star" (*Asterias*). In the other order the marginal ossicles are large, as in *Astropecten*, and it is therefore known as *Phanerozonata*. The principal forms included in the *Cryptozonata* are the "Common Sand Stars" (*Asterias*) (q.v.), *Brisinga* and its allies, the *Linckias* and the "Sun Stars" (*Solasteridae*).

Crystal (from the Greek *krustallōs*, clear ice) was the term originally applied to the clear, colourless form of quartz (q.v.), still known as rock-crystal, which occurs in six-sided prisms with six-sided terminal pyramids, and which, until the seventeenth century, was supposed to be the result of extreme cold acting upon water or some other substance. The term was afterwards extended to other bodies, some colourless, others coloured but still translucent, and others even opaque or metallic, until it came to indicate the definite geometrical form, and not the ice-like transparency.

Nicholas Steno, a Dane, recognised in 1669 that the angles of inclination of the faces of rock-crystal were constant, though the faces themselves varied in shape and size. Bartholinus, Huyghens, and Newton studied the property of double refraction (q.v.) exhibited by Iceland spar, the clear form of calcite (q.v.), and, to a less extent, by quartz; and Robert Boyle (1672) recognised that artificially prepared chemical compounds or "salts," when precipitated from solution, and metallic substances, such as bismuth, on consolidation from fusion, assume regular forms similar to natural crystals. Romé de l'Isle (1772), however, first showed the geometrical derivation of one form from another by the replacement of edges or angles and the constancy of the angles for each substance, assuming six "primitive forms"—viz. the cube, regular octahedron, regular tetrahedron, rhombohedron, octahedron with rhombic base and double six-sided pyramid. The contact-goniometer, a graduated semicircle with a movable radius, invented by Carangeau, assisted him in his work and enabled him to figure 500 forms as against 40 described by Linnæus about twelve years earlier. The abbé René Just Haüy, in 1784, by studying the laws of the natural cleavage of crystals, was led to the laws of symmetry and of whole numbers. He showed that when one edge or face of a crystal was replaced or truncated by a plane, all other geometrically similar edges or faces are similarly modified, and that the forms of crystals can be explained by supposing them to be built up of a definite number of layers of "integrant molecules," or brick-like bodies, and one, two, three,

or some other definite number of layers to be removed in the modification of any face. Haüy also showed a close connection between angles and chemical composition, as exemplified in the four minerals baryte, witherite, celestine, and strontianite, the sulphate and carbonate respectively of barium and strontium, then classed together under the one name "heavy spar." In 1809 Wollaston, by his invention of the reflecting goniometer (q.v.), a graduated circle with a vernier and movable axis, in using which the angle is measured by obtaining reflections of signals in succession in the two faces forming it, rendered much greater accuracy possible. In the same year Weiss published an epoch-making dissertation referring all crystalline forms to four classes according to their axes, or lines round which they are uniformly disposed. These classes were—(1) The cube, regular octahedron, regular tetrahedron, and rhombic dodecahedron, with three equal axes at right angles; (2) the octahedron and right (upright) prism, with three axes at right angles, but only two equal; (3) the rhombohedron, six-sided prism, and double six-sided pyramid, with four axes, three equal, equally inclined and in one plane, and a fourth perpendicular to that plane; and (4) the octahedron and four-sided prisms of which the base is not square, with three unequal axes at right angles. Mohs, who arrived at these four classes independently, in 1820, named them the Cubic, Pyramidal, Rhombohedral, and Prismatic Systems, and in 1822 asserted, as the result of more precise measurement, the existence of two other systems, in one of which two of the axes are inclined, whilst in the other all three axes are so. In 1819 Sir David Brewster divided crystals into three classes according to their action upon polarised light (q.v.): (1) those that are *isotropic* or singly-refracting, having no such action, which are those of the Cubic system, and of the Pyramidal and Hexagonal systems; (2) those which are *anisotropic* or doubly-refracting, and have one, the *optic axis*, and are *uniaxial*; and (3) those which have two *optic axes* or are *biaxial*. Further study has since confirmed Mohs' conclusions, and the systems of crystals, then known as Monoclinic, Orthorhombic, Triclinic or Anorthic, Rhombic, and Tetragonal, and the electrical properties of crystals, have been confirmed. Brewster's classification, however, is no arbitrary grouping of crystals, but is based upon the fact that certain elements, or compounds, or groups of elements, or compounds, replace one another, and thus appreciably affect the crystalline form, basing upon the fact (q.v.) the latter is a result of minute differences in the arrangement of atoms and molecules, and is now defined as a tendency to split

indefinitely in directions parallel to such surfaces or at fixed angles with them. [CRYSTALLOGRAPHY.]

Crystals are not confined absolutely to the dead mineral world, as they occur also in the cells of many plants, forming, for instance, no less than 80 per cent. of the dried tissue of the stems of some Cacti. These crystals consist of calcium sulphate, carbonate, phosphate, or most commonly oxalate, and occur either in spherical aggregations or in needle-like forms. [RAPHIDES.]

Crystal Palace, THE, is mainly the same structure as that of the Exhibition of 1851, the materials of which were sold to a company for £70,000 at the close of the year, and re-erected at Sydenham in Kent under the auspices of Sir Joseph Paxton, Owen Jones, and other architects. The Palace was opened by Queen Victoria in 1854. It has since been constantly utilised for festivals and all kinds of exhibitions. In 1866 a fire in the north wing caused damage to the amount of £150,000.

Crystalline Schists, a term now generally extended to the whole series of intimately associated rocks that includes the gneiss, mica-schists, and other foliated rocks underlying the fossiliferous and distinctly stratified Cambrian system (q.v.). Among these are the crystalline limestones, serpentinites, and layers of graphite seen in the Laurentian rocks of Canada, and quartzites, hälleflintas, and ironstones in Wales and Scandinavia, in addition to the distinctly foliated or schistose gneisses, mica-schists, talc-schists, etc., that form most of the Scottish Highlands. The total thickness of these rocks is unknown, and individual layers are very inconstant in thickness, though the series as a whole presents much the same characters all over the world. No undoubted trace of life occurs in it, *Eozoon* (q.v.) being a much-debated structure either mineral or foraminiferal, and the fibrous texture of some graphite not being necessarily a sign of vegetable origin. According to one theory of their origin, these rocks are the result of metamorphism of ordinary, possibly Cambrian, sedimentary, and volcanic material; the limestone may have been of animal origin; the graphite metamorphosed coal; and the iron oxides may have been precipitated by organic acids. Against this view may be urged the uniformly complete character of the supposed metamorphism and the fact that fragments of these rocks exhibiting the same texture as the main mass are found in Cambrian conglomerates, arguing that if any such metamorphism occurred it must have been in pre-Cambrian times. The opposing view seems to be that these rocks represent part at least of the primitive crust of the earth or were thrown down as precipitates or sublimates from a primeval atmosphere under conditions of temperature and pressure unlike anything that has since prevailed. It is chemically possible that carbonate of lime and oxide of iron may be so thrown down and graphite possibly formed directly from hydrocarbon vapour; but the interlamination of limestone and serpentine is one among several serious difficulties in the way of this view.

Crystallites, microscopic particles occurring in vitreous rocks and in some artificial slags

representing incipient crystallisation. They include *globulites*, spherical particles, sometimes concentric or radiate; *trichites*, hair-like bodies, straight, curved, or looped; *crystalloids* or grouped crystallites approximating to true crystalline forms; and *microliths*, which are apparently merely very minute crystals, as they may exhibit not only distinct faces and angles but double refraction, dichroism, and other characters of crystals. Crystallites are often in layers marking the flow of the glass when liquid, and as they increase in number the glass becomes *devitrified*, as, for example, when barley-sugar, losing its clear, brittle character, becomes cloudy, soft, and granular, becoming, in fact, sugar-candy.

Crystallography, the science of crystalline form, is a branch of the geometry of solids applied to the elucidation of the forms actually exhibited by natural inorganic substances and the cognate bodies built up in the laboratory. The history of the development of this science having been sketched in the article Crystal (q.v.), we need here only give an outline of its principles as now understood. Though, as we then saw, optical, thermal, and electrical characters are intimately related to crystalline form, crystallography deals primarily with form. In form, as Steno practically showed, linear dimensions obey no law in natural crystals. Though their angles are determinate, they are not geometrically regular solids, their faces may be of any size. The primary characteristic of crystals, however, is symmetry; their particles are symmetrically arranged with reference to certain dominant lines or *axes*, so that their bounding-planes or *faces* make angles constant for each substance, and when, as is usual, they exhibit a tendency to splitting or *cleavage*, it is in directions symmetrically arranged as are their faces. The facts of crystallography are, therefore, mainly obtained by the measurement of the angles of crystals. The most mathematically satisfactory explanation of crystalline form is that elaborated by Professor W. H. Miller in 1839. In this system the position in space of any face of any crystal is determined by its relation to three axes of indefinite length, which intersect at a point called the *origin* within the crystal. As these axes are not all in one plane, every plane in the universe must cut at least one of the three, and its position can be represented by a *symbol* of three algebraical *indices*. All parallel planes on one side of the origin have the same symbol, which implies the principle that linear dimensions are subject to no law. One of Haüy's chief discoveries was that the *intercepts* or distances from the origin along the three axes at which faces cut the axes are in the ratios of whole numbers, generally less than seven. In each of the six crystallographic systems some one plane is taken as a plane of reference, and is known as the *parametral plane*. It is one cutting all the three axes at intercepts, having a constant ratio in each system, and the simplest whole numbers expressing these ratios are called the *parameters*.

That the three crystallographic axes are not purely imaginary, but represent lines along which crystallisation has acted, is shown by the hollow,

skeleton, or hopper-shaped crystals of rock-salt, and by such crystals as those pentagonal dodecahedra of pyrite from Traversella, in which each axis is terminated at each end by a similar but smaller dodecahedron.

The law of symmetry may even control two, four, or more distinct crystals aggregated together so that they mutually intersect symmetrically and form a *twin-crystal*, or *maele*, which will often have re-entering angles, or angles the apices of which point towards the crystal, as in the arrow-shaped macles of selenite, the cruciform ones of staurolite, and the three- or six-rayed forms of snow. These latter forms are reproduced in the "negative" crystals, or ice-flowers, hollows melted by Professor Tyndall from the centre of a block of ice by a beam of electricity.

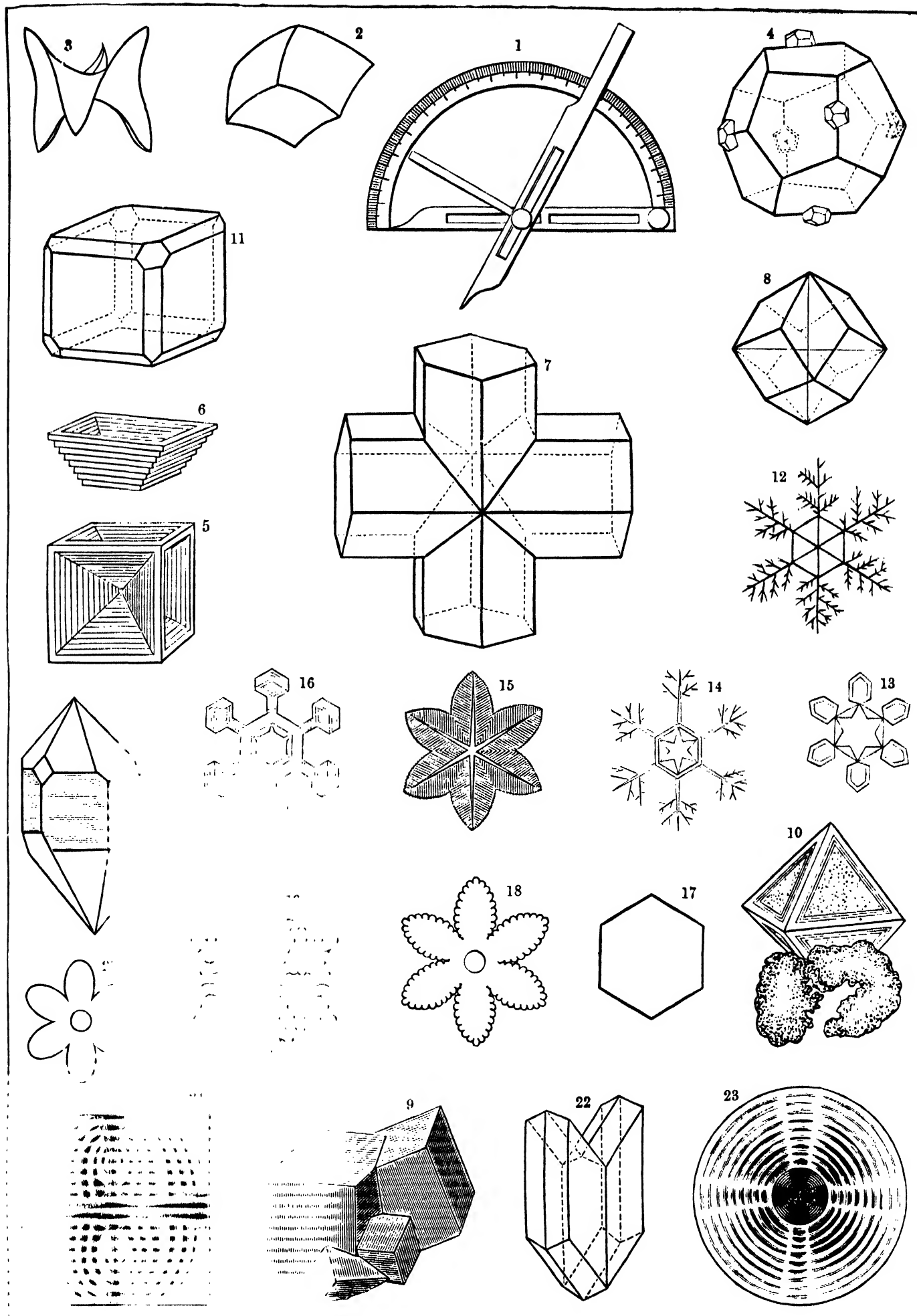
On the other hand, there are partial exceptions to symmetry in what are termed *hemihedral* or *merosymmetrical* forms, such as those cubes of boracite (q.v.), in which four out of their eight angles are truncated. Such forms exhibit differences of thermo-electric properties corresponding to these differences of form.

The six systems are—(1) The *Cubic*, tesseral or monometric, with the most perfect symmetry, nine *planes of symmetry*, its three axes at right angles and its three parameters equal, including the *cube*, as in rock-salt, fluor, and pyrite; the *regular* or equilateral *octahedron*, as in magnetite; the *rhombic dodecahedron*, as in garnet, and many other forms; (2) the *Pyramidal*, tetragonal or dimetric, including the *right-square prism* and *square-based octahedron*, with five symmetrical planes, axes at right angles, and two parameters equal, exemplified by tinstone; (3) the *Rhombohedral*, or hexagonal, including the *rhombohedron*, with three planes of symmetry, the *six-sided prism*, with seven, the *scalenoedron*, and many other forms, with axes at equal but not right angles and equal parameters, and exemplified by calcite, quartz, beryl, etc.; (4) the *Prismatic*, rhombic or trimetric, with three symmetrical planes, axes at right angles and unequal parameters, including *rhombic prisms* and octahedra with rhombic bases, as in sulphur; (5) the *Oblique*, or monoclinic, with one plane of symmetry, only one axis at right angles to each of the others, and unequal parameters, including *oblique prisms*, as in gypsum, augite, and hornblende; and (6) the *Anorthic*, or triclinic, with no plane of symmetry, axes all at unequal angles and parameters unequal, including certain *doubly oblique* forms, as in blue vitriol.

Crystalloids. [CRYSTALLITES.]

Csaba, a town of Hungary, beyond the Theiss, distant 7 miles from Békes. Corn and lint are grown in the district, and there is a brisk trade in cattle, sheep, silkworms, fruit, wine, hemp, and flax.

Csoma de Kőrös, ALEXANDER, a Transylvanian traveller and philologist, was born in 1784 in the village of Kőrös, and after studying at Göttingen, started in 1820 on an eastern philological tour, visiting Egypt, Persia, and Tibet. On his arrival in Calcutta, in 1831, he devoted several



CRYSTALLOGRAPHY.

Some of the most common
crystals of the
mineral kingdom
are shown in the
following illustrations.

1 Rhombohedra of Dolomite with curved faces. 4 Pentagonal Dodecahedron of
Terminated by Crystals. 5, 6 Hopper-shaped Crystals of Rock-salt. 7 Cruciform
Dodecahedron. 9 Cubes of Pyrite striated parallel to edges of Pentagonal Dodecahe-
dron having winged edges. 11 Hemihedral Crystal of Boracite. 12 to 17 Snow
flakes of negative Crystals. 21 Common Hexagonal form of Quartz. 22 Arrow-head shaped
Crystal of Quartz. 23 Of Bismuth Crystal.

Columbus discovered this island in his first voyage. Velazquez occupied it in 1511, dividing all the land and its enslaved aborigines, a peaceful delicate race, between his Spanish followers. The monk Las Casas has described the horrors of that epoch. The natives were soon extinguished by the cruelty of their masters, who afterwards imported negroes as substitutes. English and French pirates frequently attacked the Spaniards of Cuba from the end of the 16th century to the middle of the 18th. In 1762 Sir George Pocock, with 200 ships and 18,000 sailors, and the Earl of Albemarle, with 14,000 soldiers, conquered Havana, the capital of the island ; nine months after it was given back to Spain in exchange for Florida. England did not understand the strategical and commercial value of her conquest. Spain turned her attention

to Cuba after she lost all her other American colonies, but her rule was so despotic that in 1868 a war for freedom was commenced, which raged with great ferocity and destruction of life and property for ten years until it ended by a compact of the Government with the rebels. In 1895, however, the insurrection broke out afresh, and a harassing war was carried on; the advantage being mainly with the Cubans. In 1898 America interfered and freed Cuba from the Spanish rule, granting them autonomy.

Cube, in *Geometry*, a regular six-sided solid, with all its faces perfect squares. It is a square prism, with height equal to the length of either side of the base. It thus has twelve edges all of equal length. Its volume is obtained by cubing the length of an edge. This is $\frac{4}{3}$ ths of the volume of the enclosed sphere. In *Arithmetic* it is the number obtained by multiplying a number by itself three times. The process of cube-root is that of obtaining the original number from its cube.

Cubebs, a name originating in Arab medicine for the dried fruits of species of *Cubeba*, a genus allied to the peppers, especially of *C. officinalis*, a woody climber in Borneo, Java, and Sumatra. The fruits are globose, $\frac{1}{4}$ inch in diameter, greyish or black, and wrinkled, and grow in spikes of 40 or 50. They are agreeably aromatic, pungent, and slightly bitter, yielding 15 per cent. of a volatile oil containing a camphor, a characteristic alkaloid, *cubebin*, and an acid, *cubebic*. Britain imports about 60 tons annually *via* Singapore. The drug is employed to arrest excessive mucous urethral discharge.

Cubic Equations in algebra are such as contain the cube of the unknown quantity, but no higher power thereof. Methods are available for the solution of any cubic equation.

Cubitt, SIR WILLIAM, civil engineer, born in 1785 at Dilham in Norfolk, was the inventor of the treadmill. In 1812 he entered the service of Messrs. Ransome, of Ipswich, and soon became their chief engineer. Continuing in that post until 1826, he then removed to London, having previously become a member of the Institution of Civil Engineers in 1823. He assisted in the erection of the Crystal Palace in 1851, was knighted for his services in the same year, and died at Clapham in 1861.

Cuckoo, a book-name for the *Cuculidæ*, in Huxley's classification ranged under the *Coccygomorphæ*, and in older systems placed among the Picarian birds. The family contains 180 species, arranged in 35 genera, and characterised by a slender body, wings of moderate length, a long graduated tail of from eight to twelve feathers, the beak with sharp edges, and the feet generally long and powerful, with short toes. They abound in warm climates, but in cold and temperate regions they are sparsely distributed, or appear only as visitors. Many of them are parasitic in habit, and some have a strange resemblance to other birds of widely different genera. Thus the Common Cuckoo is very like a hawk, and in some parts of England it is believed that it actually does change into a hawk in the winter; and one of the Bush Cuckoos (*Carpococcyx*

radiatus) closely resembles a pheasant in appearance and gait. The type-genus (*Cuculus*) contains about 20 species, distributed through the Palæarctic, Ethiopian, and Oriental regions, some of them ranging to the Moluccas and Australia. They have the bill broad at the base, the wings long and pointed, the upper tail-coverts long, the feet slender and very short, and the legs feathered behind almost to the toes. All are parasitic. The Common Cuckoo (*C. canorus*) breeds in all the northern portions of the Old World, visiting India, China, Java, and South-western Africa in its southern migration. The male is about 14 inches long, deep ash-grey above, greyish white with black markings below; the neck, cheeks, throat, pure ash-grey; tail feathers, black, spotted with white. The eyes are bright yellow, as are the feet, the beak with a yellowish tinge at the base. The female is about an inch shorter, but has scarcely perceptible reddish stripes on the back and under side of the neck. The young birds are blackish, mottled with yellow and grey, with a good deal of white about the hind neck. The Cuckoo, which arrives in England in April or May and leaves again in August or September, is probably the best known of our feathered visitants. The cry of the male, whence the bird is named, is familiar to everyone. The female has two calls—one resembling that of the male, but sharper, and one which Brehm syllables *kwi-kwi-kwi*, that seems to exert an extraordinary influence on all the males within hearing. Old birds feed entirely on insects and their larvæ, seemingly preferring hairy caterpillars. These they devour in great numbers, and the hairs adhere so closely to the mucous membrane of the stomach as to convey the impression that that organ is covered with hairs. The young birds will occasionally feed on berries. The flight is light and elegant, somewhat like that of a falcon.

The Cuckoo's parasitic habit has been known since the days of Aristotle. The hen bird lays her eggs singly on the ground—sometimes as many as eight in the season—taking each egg as soon as laid in her bill and depositing it in the nest of some bird that feeds its own young on insects. Some fifty birds are said to act as unconscious foster-parents to young cuckoos, but the eggs are most frequently deposited in the nests of the hedge sparrow, water wagtail, titlark, yellow ammer, green linnet, and whinchat. The fact that hen cuckoos have been shot with eggs in their bills has given rise to the story, which has no foundation in fact, that they suck the eggs of other birds. The young Cuckoo frequently repays the hospitality accorded it by ejecting the rightful brood, and it always monopolises the bulk of the food, of course to their loss. To account for the parasitism of these birds Darwin supposes that the progenitor of the European Cuckoo occasionally laid an egg in another bird's nest, that some advantage accrued to the old bird or to the fostered young, and that "the young thus reared would be apt to follow by inheritance the occasional and aberrant habit of their mother."

Cuckoo Bees, a group of bees principally belonging to the genus *Nomada*. Their popular name

of steel, or other substance, as for instance in the case of the Cent Gardes of Napoleon III., of aluminium. In the English army, though the name is not used, the equipment has been used since Waterloo on all ceremonial occasions, though not upon active service, by the Life Guards and Horse Guards. Most European armies have Cuirassiers.

Cujacius, or CUJAS, Jacques, French jurist, son of a tanner, was born at Toulouse in 1520. His industry overcame all obstacles to learning, his attention being chiefly devoted to the study of Roman law, on which he commenced to lecture in 1547. Elected professor at Cahors in 1554, he continued his lectures there, and in other towns, until the year 1567, and finally took up his abode at Bourges in 1577, where he continued his instructions until his death in 1590. He left voluminous works, consisting of commentaries and expositions of the Roman law.

Culdees, either from Celtic words meaning *servants of God*, or from Latin ones meaning *worshippers of God*, were an order of irregular monks who were found in parts of England, Scotland, and Wales from the ninth or tenth century to the fourteenth or fifteenth. They have owed their remembrance chiefly to a mistaken idea that they formed a link between later times and an original and pure form of Christianity which prevailed in these countries in very early times. Many of them were absorbed into regular orders, and others were dispersed with or without compensation.

Cullen, PAUL, CARDINAL, D.D., was born in 1803 in county Kildare, Ireland, and educated at Shackleton School, Ballytore, at Carlow College, and the Urban College of the Propaganda at Rome, of which he was appointed rector in 1848. After saving the property of the Propaganda during the supremacy of the triumvirate in the pontifical states, by invoking the protection of American ships of war, on the death of the primate in 1849 Cullen was consecrated as his successor in 1850, and two years later was translated to the archbishopric of Dublin on the death of Dr. Murray, and in 1866 was created a cardinal prince, under the title of San Pietro in Montorio. He was a churchman of the advanced ultramontane school, a rigid disciplinarian and vigorous opponent of all secret societies and the system of mixed education then in force. He was active in founding Catholic schools, colleges, and other institutions. His death occurred in Dublin in 1878.

Cullen, WILLIAM, physician, was born at Hamilton, Lanark, in 1710, and studied at Glasgow University. In 1729 he became surgeon in a merchant ship trading to the West Indies, and on his return acted as assistant to an apothecary in London. Continuing to study assiduously, in 1736 he started practice on his own account at Hamilton. After taking his M.D. at Glasgow in 1740, four years later, having married in the interval, he removed to that town, where he founded a medical school, and had as his pupil Joseph Black, the well-known scientist. In 1755 he was appointed professor of chemistry at Edinburgh, where his

chemical and clinical lectures were soon largely attended, and here, at a later date, he successively held the chairs of materia medica, and theoretical and practical medicine. He was president of the Edinburgh College of Physicians from 1773 to 1775, and died in 1790. His principal works are his *First Lines of the Practice of Physic*, *Institutions of Medicine*, *Synopsis Nosologiæ Methodicæ*, and his *Treatise of the Materia Medica*.

Cullera, a town of Spain, at the mouth of the Jucar, 24 to 25 miles S.S.E. of the town of Valencia. It is a place of some military importance, and has a thriving export trade in grain, wine, fruits, etc.

Culloden, or DRUMMOSSIE MOOR, is situated from 3 to 5 miles E. of Inverness, and consists of a moory ridge, famous for the defeat of the Young Pretender by the Duke of Cumberland in 1746. A monument marks the site of the battle.

Culm. 1. In *Botany* culm is a term sometimes used for the slender stems of grasses which mostly have solid nodes and elongated hollow internodes, reaching in the bamboos considerable size. [STEM.]

2. In *Geology* culm is applied to an inferior slaty or stony variety of coal, worked in Pembrokeshire and North Devon.

Culmination, in *Astronomy*, is the instant at which a star crosses the meridian. The sun, for instance, culminates at what we call mid-day. Knowing the instant at which a star culminates at Greenwich, or any other standard meridian, observation of the time at which it culminates elsewhere affords a method of determining the longitude of the spot.

Culpeper, NICHOLAS, herbalist and astrologist, was born in London in 1616, and studied at Cambridge. In 1640, after serving as apprentice to an apothecary in Bishopsgate, he opened an establishment in Spitalfields as an astrologer. During the Civil war he sided with Parliament, and in 1649 incurred the enmity of the medical faculty by his publication of a *Physical Directory*, or a *Translation of the London Dispensatory*. Numerous works are attributed to Culpeper, but their authenticity is doubtful. He died in 1653-4.

Culverin (Fr. *coulévrine*, from *coulévrre*, serpent), an ancient name for a cannon. In the early part of the sixteenth century it strictly denoted a heavy gun very much resembling the later much-praised "long eighteen." The word is also used loosely to denote any small early gun.

Culvert, in *Civil Engineering*, is a water-drain under a road, railway, or embankment. It is built of stone or brickwork, arched both at top and bottom. Its section must be designed so as to afford a sufficiently large channel for any quantity of water that is likely to flow through.

Culverwel, NATHANIEL, divine, was born in Middlesex, and graduated at Cambridge in 1633. During the Civil war his sympathies lay with the Parliament. His writings are vigorous, and possess great descriptive power. The most noteworthy of his works are his *Light of Nature*, *Sacred Optics*, *Spiritual Optics*, and the *Worth of Souls*. He was

a contemporary of Cudworth, Whichcote, and John Smith, and was one of the Cambridge Platonists.

Cumae, a maritime city of Campania in Italy, the legendary abode of the Sibyl, stated by Strabo to be the oldest of the Greek colonies in that country, and probably founded by colonists from Chalcis and Cyme in Asia Minor. By 700 B.C. it attained to an extraordinary degree of prosperity, owing to the fertility of its soil and its excellent harbours, and some twenty years before the usurpation of the tyrant Aristodemus, about 505 B.C., was powerful enough to repulse a formidable invasion of Etruscan and other hostile tribes. In 474 B.C. it gained the signal victory of Hieron over the Tyrrhenian and Carthaginian fleets, but was in turn taken by storm by the Samnites 420 B.C., its defenders being slain or reduced to slavery. Subsequently, it received the Roman franchise 338 B.C.

Cumana or **NEW TOLEDO**, a maritime city of Venezuela, capital of the state of Cumana, at the mouth of the Manzanares, founded by Diego Castellon in 1523. It has a good roadstead, a healthy climate, and fair export trade, but is subject to earthquakes.

Cumberland. 1. A county in the extreme N.W. of England, is bounded on the N. and N.W. by Scotland, on the S. by Lancashire, Westmoreland, Durham, and Northumberland, on the E. and N.E. by Northumberland and Durham, and on the W. by the Irish Sea. Its surface is mountainous and on the whole sterile, but it abounds in lakes and rivers. The principal lakes are Derwentwater, Ulleswater, Windermere, Thirlmere, Bassenthwaite, and Buttermere, and the principal rivers the Eden, the Irthing, and the Great Ouse. There are two distinct mountain ranges, one running N., the other S.W. The highest elevations are Scaw Fell (3,162), Helvellyn (3,192), and Bow Fell (2,960), and the principal minerals are to be found in the mountains, including iron, lead, stone, slate, quartz, spar, &c. The principal crops are wheat, oats, turnips, &c. The principal manufactures are cotton-ware, wool, flax, and corn. The county is divided into 10 parliamentary divisions, each containing a Pop. (1901), 266,921. 2. A county in the State of Kentucky, and is bounded on the N. by Virginia, on the E. by North Carolina, on the S. by Tennessee, and on the W. by Missouri. It is one of the most fertile and productive of the State, and is famous for its horses, cattle, and sheep. The principal cities are Lexington, Frankfort, and Louisville. The principal industries are horse-breeding, cattle-raising, and sheep-raising. The principal crops are wheat, corn, and oats. The principal manufactures are horse-drawn machinery, and agricultural implements. The principal exports are horses, cattle, and sheep. The principal imports are grain, and manufactured goods.

3. A county in the State of New York, and is bounded on the N. by Canada, on the E. by Ontario, on the S. by Westchester, and on the W. by Dutchess. It is one of the most fertile and productive of the State, and is famous for its horses, cattle, and sheep. The principal cities are Poughkeepsie, and Newburgh. The principal industries are horse-breeding, cattle-raising, and sheep-raising. The principal crops are wheat, corn, and oats. The principal manufactures are horse-drawn machinery, and agricultural implements. The principal exports are horses, cattle, and sheep. The principal imports are grain, and manufactured goods.

Cumberland, WILLIAM AUGUSTUS, DUKE OF, second son of George II., was born in 1721, wounded at Dettingen in 1743, and defeated at Fontenoy, in Flanders, by Marshal Saxe in 1745. In 1746 he totally routed the forces of the younger Pretender at Culloden, following up his victory with great cruelty. His disgraceful capitulation at Closter-Seven in 1757 closed his military career. He died at Windsor in 1765.

Cumberland Presbyterians, a sect originating in 1810 in Kentucky, U.S., through a disagreement of the Presbytery of Cumberland with the Synod of the State as to the qualifications of candidates for the pastorate. They diverge considerably in doctrine from the main body of Presbyterians.

Cumin, or **CUMMIN** (*Cuminum Cyminum*), an annual umbelliferous herb, indigenous to Upper Egypt, with multifid leaves having filiform segments and elongated fruits, the halves of which (mericarps), erroneously called "seeds," are used in the manufacture of curry powder, and in veterinary medicine. These "seeds" are larger, lighter in colour, and hotter in taste than caraways, being two lines in length, and each of them has nine longitudinal ridges instead of five, with an oil-channel or vitta beneath each ridge. Cumin was esteemed as a carminative in ancient times, and as a spice in the Middle Ages. Britain now imports from 400 to 500 tons annually, chiefly from Mogador, Malta, and Sicily.

Cumming, JOHN, D.D., Scottish divine, was born in the parish of Fintray in Aberdeenshire in 1807, and educated at the Aberdeen grammar school and university. In 1832, having been licensed to preach, he came to London and drew together large congregations at the National Scottish church, Crown Court, Covent Garden. He was created a D.D. of Edinburgh in 1844, and thenceforth led an active life, preaching, founding benevolent institutions, and engaging in polemical discussions, both verbally and with his pen. He was an ultra-Protestant, and a strong opponent of the Free Church party in Scotland. His writings on prophecy are the best known of his numerous publications. He died in 1881.

Cumming, ROUALEYN GEORGE GORDON, the African lion hunter, was born in 1820, educated at Eton, and in 1838 entered the East India Company's service. Resigning his commission in 1840, after serving in Canada and the Cape Mounted Rifles at the close of 1843 he organised and carried out a five years' hunting expedition in the interior of South Africa. He returned to England in 1848, and delivered lectures on his adventures. His chief works are his *Five Years of a Hunter's Life*, and *The Lion Hunter of South Africa*. He died at Fort Augustus in 1866.

Cummins, MARIA S., American authoress, was born in 1827, and is best known by her novel, *The Lamplighter*. Besides contributions to the magazines, she also published other works of fiction, entitled *Haunted Hearts*, *El Fureidis*, and *Mabel Vaughan*. She died in 1866.

Cunard, SIR SAMUEL, BART., shipowner, was born in 1787 at Halifax, Nova Scotia. He originated, and, in conjunction with Mr. George Burns, of Glasgow, and Mr. David MacIver, of Liverpool, carried out the scheme of a steam mail service to run between England and America, called the British and North American Royal Mail Steam Packet Company. In 1840 the *Britannia*, carrying the mails, steamed out of Liverpool, and arrived in Boston in less than fifteen days. In 1855 the *Persia*, the first iron boat, was launched. The *Scotia*, the last paddle-steamer of the Atlantic service, was put on in 1862 and withdrawn in 1869. It was long the boast of the Company that they had never lost a life or a letter. A baronetcy was conferred on the founder of the Cunard line in 1859. He died in London in 1865.

Cunas, aborigines of the Isthmus of Darien, Central America, in the Tuyra, Tanera, and Lower Atrato valleys. They call themselves Tulé, and form a confederacy with the San Blas Indians, their independence being recognised, or at least tolerated by the Colombian Government. They are of middle height but robust, with light brown complexion, and abundant black hair, worn very long by the men and girls, but cut short by the married women. The Tulé language shows some affinity with Carib.

Cunaxa, the battle-ground of Cyrus the Younger and his brother Artaxerxes, 401 B.C., distant 500 stadia from Babylon.

Cundinamarca, a central state of the United States of Columbia, capital Bogota, with an area of 8,455 square miles and a mixed population. The eastern surface is flat, the western mountainous. Minerals are plentiful, and the soil in many parts is highly productive.

Cuneiform (Lat. for *wedge-shaped*), a kind of writing thought to have been practised as early as 3000 B.C., and to have been introduced into Mesopotamia and Persia, and to have been employed largely over western Asia. At first picture-writing, in which each object spoken of was represented, the signs became conventional and permanent, and underwent modification and simplification to save time and trouble on the part of the scribes. The peculiar wedge or arrow shape probably arose from the form of the instrument with which the signs were impressed upon clay, which was the usual medium employed. Different degrees of development have led to the classification into Archaic, Hieratic, Assyrian, and later Babylonian. The Persian arrow-headed writing of the time of Darius employs forty different characters.

Cuneiform Bone. [WRIST.]

Cunningham, SIR ALEXANDER (1814-1893), soldier and archaeologist, was born in London, and educated at Christ's Hospital and Addiscombe. Obtaining a commission in the Engineers in 1831, he became, successively, aide-de-camp to the Governor-General of India in 1834, engineer to the King of Oudh in 1840 and to the North-Western Provinces in 1858, and in 1870 archaeological

surveyor-general of India. In 1871 the order of Companion of the Star of India was conferred upon him in recognition of his services. Among his works are *The Bhilsa Topes; or, Buddhist Monuments of Central India, Ladak, Physical, Statistical, and Historical*, and various papers on Indian antiquities.

Cunningham, ALLAN, poet and author, was born at Keir, Dumfriesshire, in 1784. He is best known as a close imitator of the poet Burns, in whose neighbourhood he lived at Dalwinston. Commencing life as a stonemason, he soon devoted himself to literary work. He became a friend of Hogg, the "Ettrick shepherd," and later of Sir Walter Scott. In 1810 a volume appeared by Cromek, a London publisher, called *Remains of Nithsdale and Galloway Song*, purporting to be a collection of stray writings of Burns, but which in reality almost entirely emanated from the brain of Cunningham. At the solicitation of Cromek he now came to London, where he married, and earned a living by miscellaneous literary work and employment given by the sculptors Bubb and Chantrey, and formed the acquaintance of the leading literary men of the day, including Carlyle, Southey, Wilson, and Lockhart. He died in 1842. His chief claim to literary fame lies in some spirited poems—*The Mermaid of Galloway, A Wet Sheet and a Flowing Sea, It's Hame and it's Hame*, and local tales relating to his district, as well as a work entitled *Lives of the Most Famous British Painters, Sculptors, and Architects*.

Cunningham, JOHN, D.D., LL.D., Scottish divine, was born at Paisley in 1819, and was educated at the Universities of Glasgow and Edinburgh. In 1845 he became minister of the parish of Crieff, and in 1886, on the death of Principal Tulloch, of St. Mary's College, St. Andrew's, was nominated his successor. Besides contributing to numerous magazines, including *Macmillan's Magazine*, the *Westminster*, *Edinburgh*, and *North British Reviews*, he was the author of the *Church History of Scotland* (1859), *The Quakers*, *The Growth of the Church in its Organisation and Institutions*. He died in 1893.

Cup (Gk. *kupellon*) represents first a hollow, then a hollowed vessel for holding liquids. The word is also employed to denote certain compounded beverages, such as champagne cup, claret cup, cider cup, beer cup, each taking its name from the principal ingredient.

Cup Markings, a collective name for cup-like depressions on prehistoric sepulchral monuments and on stone weapons and implements. In the former case they are of two kinds—simple cups, and cups surrounded by concentric circles, and nothing is known of their origin or purpose. In the latter they seem to have served to afford a firm grip, and in some instances show that the stone was used as a journal or bearing.

Cupar, or CUPAR-FIFE, a town of Fife, capital of the shire on the Eden, and an ancient royal borough, returning a member to Parliament in conjunction with five other towns. It is 12½ miles S. of Dundee, and 30 N.N.E. of Edinburgh. It was

[illegible]

Curassow, any bird of the arboreal gallinaceous genus *Crax*, from the forests of the Neotropical region. There are eight species, rather smaller than turkeys, with black or sombre plumage, curly crest, and a fleshy knob on the bill. There are fourteen tail-feathers, spread out and inclined. The Hocco (*C. alector*) is the Royal Pheasant of the Mexicans. These birds usually go in couples or small companies, and feed on worms, seeds, and fruit. They are unsuspicious and easily tamed,

"but the natives have found the turkey more profitable, or discovered that the Hocco does not multiply easily in confinement." The rare Mountain Curassow (*Oreophasis derbianus*), from Guatemala, belongs to the same family. [GUAN.]

Curate, strictly one that has a cure of souls, and the word is so used in the Church liturgy and rubrics. But it is generally now confined to a clergyman who has no benefice, and whose tenure of his office depends upon the will of his rector or vicar, and bishop. The status and the lot of the ordinary curate form one of the most perplexing questions of ecclesiastical organisation. A perpetual curate was one who was employed to fulfil the spiritual functions of a benefice whose emoluments were in the hands of a layman. Recent legislation has almost led to the disuse of the term perpetual curate.

Curb (fr. French *courber*, and Lat. *curvus*), that which is bent, or that which bends, turns, restrains or limits. In driving or riding the curb is a chain passing from the cheek-pieces of a horse's bit beneath his lower jaw, and capable of bringing a powerful leverage to bear upon the jaw. The curb of a well is the stone casing which prevents its falling in, and the curb of a street is the edging that demarcates the street from the pavement. The word is largely used in metaphor.

Curé, the principal priest or incumbent of a parish in France and French-speaking countries. The French *vicaire* corresponds to our *curate*.

Cureton, WILLIAM (1808-1864), a great Syriac scholar, born at Westbury in Shropshire, was educated at Newport grammar school and at Christ Church, Oxford, of which house he was a chaplain. He was appointed assistant-librarian at the Bodleian, and in 1834 he became assistant-keeper of MSS. at the British Museum. In 1849 he was appointed Canon of Westminster and rector of St. Margaret's church. Among his services to literature was the elucidation of some epistles from St. Ignatius to St. Polycarp and others, discovered at Nitria. These he published with notes and a translation, and their appearance involved him in much controversy. He also discovered the remains of a recension of the four Gospels, and made many other contributions to Oriental scholarship.

Curfew (Fr. *couvre feu*), a bell which in ancient times in England rang at a certain hour in the evening to warn people to put out their fires. The practice is sometimes thought to have been a creation of Norman tyranny, but probably existed long before, and had for its simple object the putting out of fires. The curfew is still rung in some parts of England, usually at sunset or eight o'clock, though Shakspeare, in *Romeo and Juliet*, says, "The curfew bell has rung, 'Tis three o'clock." This, however, may be a misreading of eight. The word also denoted an ornamented cover for the fire.

Curico, a Chilian province having a capital of the same name, which is about 140 miles S.E. of Valparaiso. Population of capital over 10,000.

Curie, PROFESSOR PIERRE (1859-1906), was educated at the Sorbonne. In 1898 he, with his wife, began to follow Becquerel's investigations into the radiations of uranium and its compounds, and the researches ended in the discovery of radium (q.v.). In 1903 Monsieur and Madame Curie were jointly awarded the Davy Medal of the Royal Society, and in the same year the Nobel Prize for Physics was divided between them and M. Henri Becquerel.

Curlew, any bird of the wading genus *Numenius*, with sixteen species, some of which are found all over the world. The Common Curlew (*N. arquatus*) is a native of Britain; the body is about as large as that of a chicken; the legs and bill are very long, the latter strongly curved; and the total length of the bird is about twenty-seven inches. The plumage is ash-coloured, spotted with shades of brown. Curlews are shore birds in winter, passing the warmer part of the year on high moorlands. They feed on molluscs, worms, and insects, and are esteemed for the table. The nest is a rude structure of dry leaves, and the eggs, usually four, are olive green, with dark blotches.

Curling, a Scottish national game of great popularity played upon the ice. A rink of about 42 yards is marked upon the ice, and at each end there is a goal called a *tee*, with a circle of 17 feet in diameter inside of which any ball must be to count. Each player has a pair of curling-stones which vary from 35 to 50 lbs. in weight, and from 30 to 36 ins. in diameter, with a height of 4 or 4½ inches, and fitted at the top with a curved handle for propulsion. The players may consist of any even number, and the object of each is to get his own ball as near as possible to the tee, to drive out an enemy's, or help on a friend's. At a certain distance from each end of the rink is marked a line called the hog score, and any ball falling short of this is out of play.

Curll, EDMUND (1675-1747), a somewhat notorious London bookseller. A quarrel with Pope caused his insertion in the *Dunciad*. He busied himself with the publication of indecent literature, and once he was tried and convicted for publication of obscene books, and twice he appeared before the Lords for publishing matter concerning them. With reference to some biographies which he produced he was said by Arbuthnot to have added a new terror to death, a remark that has been credited to Lord Brougham with reference to Campbell's *Lives of the Judges and the Chancellors*.

Curran, JOHN PHILPOT (1750-1817), was born in Cork, and by his talent attracted the attention of a clergyman, who forwarded his education and was the means of his entry at Trinity College, Dublin. Curran himself tells us how, when a successful barrister, he came home and found the clergyman sitting by his fire, and of the somewhat theatrical reception he gave his benefactor. From Dublin Curran came to London, and figured largely at debating societies, where his Irish eloquence produced a great effect. He married, and in 1775 was

called to the bar. His early nervousness was cured by an insult from the presiding judge at a trial in which he was concerned, and very soon his success in cases and his readiness to back his opinions in a duel made him a popular advocate. In 1782 he became a King's Counsel, and next year entered Parliament. He was greatly opposed to the Act of Union, and at first thought of abandoning his career and going to America. However, he changed his mind upon this point. He won great renown in several State trials, and made a very effective speech in a celebrated elopement case. His later years were not without clouds, for his wife eloped, and his daughter—who was attached to the rebel Emmet—died of a broken heart, and he himself was suspected of complicity in the rebellion. In 1806 he was made Privy Councillor and Master of the Rolls, a post which he held for eight years. He then retired, and spent his remaining years in London, where he enjoyed the companionship of Sheridan, Moore, Erskine, and Godwin.

Currant, the sun-dried fruit of a small-fruited variety of the grape (*Vitis vinifera*, var. *corinthiaca*), grown chiefly in Greece and the Ionian Isles, where it seldom forms any seed. It takes its name from Corinth; but the kinds now distinguished in commerce are Vostitza, Patras, Gulf, Cephalonia, and Zante. The duty on currants imported into Britain fell from 44s. per cwt. before 1834 to 2s. per cwt. in 1890. Of late years there has been a great increase of import, which is now about 120,000 tons per annum. The name currant has been extended to the totally different fruits of *Ribes nigrum* and *R. rubrum*, small shrubs native to Britain and northern temperate or sub-arctic regions generally, and belonging to a small order related to the currants, but bearing pendulous racemes of green berries, whereas the currant fruit is a true berry, and the calyx is a true calyx. Garden currants, the red currant, bear various varieties of fruit. Both red and black currants are used for jellies, and wines; black currants are also valuable as a gargle or in lozenges.

Currant V. In English households, but not in the East, the fruit is bottled and then bottled before drinking. Sometimes are added to improve the flavor.

Cl. The term is the term for the magnitude of the motion only, there is no definite direction of way that the surface must, however, in the case of a current, flow from one point to another continuously because of pressure

of the electricity, or, as it is termed, a *difference of potential*, must likewise exist between them. So, in hydraulics, a conducting channel must exist for a current of water to pass from one point to another, between which in the same way a difference of pressure must exist. The magnitude of the electric current will necessarily depend on the conducting power or *conductance* of the medium between the points, and also on the difference of potential between them. The ordinary unit of current is the *ampère*, which is the intensity of the current when the unit quantity of one *coulomb* is displaced across any section of the conductor per second. It is also the current which flows through one *ohm* resistance, when its two ends are at one *volt* difference of potential. With a steady current the quantity displaced across any section of an electric circuit must be the same. Instruments for measuring current intensity are called *ampère-meters*, or *ammeters*. Of these there are many types in commercial use. They should be sensitive, that is to say, they should give obvious readings for small currents; they should be dead-beat, that is, recording the steady reading at once without wasting time in oscillations of the pointer or needle; they should be unaffected by neighbouring magnets or electric circuits and should be portable, direct-reading, and cheap. All these qualifications are not possessed by any single instrument, but circumstances may permit one or more of the conditions to be neglected. [ELECTRICITY.] Currents are either continuous or alternating. In the former the displacements are always in the same direction, whereas in the latter the displacements periodically change their direction. Thus, in an alternating-current circuit the magnitude of displacement in any one direction in a given time is zero. Nevertheless, alternating currents have many industrial applications.

2. **CURRENT**, in *Hydraulics*, signifies the flow of water or other liquid from place to place. The current in any channel may be measured by the quantity of water flowing past any section per second. This quantity will depend upon the area of this section, and upon the average speed of flow at right angles to the section. To measure the current we may in the case of small channels erect a triangular or rectangular or *gauge-notch*, through which the water shall flow. Observations of the upper level of the water and of the dimensions of the notch afford a means of calculating the quantity flowing through per second. If the stream be large, the exact shape and dimensions of a suitable section of the stream are obtained by soundings, and the speed or flow at various points in the section determined by specially designed current meters. These data, if sufficiently numerous, enable us to calculate the current.

Currents, **OCEAN**, movements of the surface-waters of the ocean in a constant direction under the influence mainly of the constant or trade-winds (q.v.). Thus, currents from the north-east and south-east unite in equatorial latitudes into one westerly current. This is deflected to the north and south by the intervention of continental land-masses, and

the resulting currents may also be influenced by the earth's rotation and by the anti-trade winds. These causes seem, in fact, to tend to produce an easterly current in temperate latitudes. Thus, in the Atlantic a current from between the Azores and Portugal towards Cape Verd, known as the *African current*, unites with one from the Cape of Good Hope to the Gulf of Guinea, the *South African current*, to form an *Equatorial current*. The south-east trade-wind, being stronger than the north-east, deflects the greater part of this current north-westward from Cape St. Roque into the Caribbean Sea and the Gulf of Mexico, whence it issues as the *Gulf Stream*, whilst the smaller part turns southwards to the mouth of the La Plata as the *Brazil current*. The Gulf Stream flows through the Florida Strait at a rate of between four and five miles an hour, with a surface temperature reaching 80° F. It flows parallel to the coast of the United States, but is separated therefrom by a cold prolongation of the Labrador current from Baffin's Bay until it is lost about the latitude of the Azores. In the comparatively still water between it and the North Equatorial current is the mass of floating seaweed known as the *Sargasso Sea*. The Brazil current flowing eastwards from the La Plata towards the Cape of Good Hope is mainly absorbed in the northerly South African current, but in part flows eastward towards the Crozet Islands. Similarly, in the Pacific, the *Pacific current* from Alaska down the coast to Mexico, and the *Peruvian current* from Patagonia up the coast to Ecuador, cross the ocean as parallel equatorial currents mainly to the north of the equator. The northern one is mainly deflected northward and north-eastward as the *Japan current* or Kuro Siwo to the Aleutian Isles, whilst no defined cold current meets it from the narrow and shallow Behring Strait. The South Equatorial finds its way in part through Torres and Sunda Straits into the Indian Ocean, the remainder being deflected from Fiji towards Brisbane, whence it flows back eastward to the north of New Zealand and toward Cape Horn. In the Indian Ocean a single equatorial current flows from the Sunda Islands to the Mascarenes, whence part of it circles round past Socotra into the Arabian Sea, whilst two other parts flow down each side of Madagascar, unite, and off Cape Agulhas are abruptly deflected eastward towards St. Paul, and so on to Tasmania and the South Pacific. These currents are seldom more than 500 feet deep.

Besides these currents due mainly to wind, there seems good evidence of a slow general circulation of all the water of the ocean, due to convection currents. [OCEAN.]

Curry Powder (from Hind. *kuri*, an Indian dish) is a powder which is much used in India and Ceylon, and by Anglo-Indians in this country, and in cooking generally, as a condiment to season different dishes into which rice generally enters largely. There are at least forty methods of preparing a curry, and many ingredients, and those in varying proportions, enter into its composition. Among such substances are anise, allspice, almonds, coriander seed, cinnamon, mustard, ginger, cloves,

poppy-seeds, cayenne pepper, salt, onions, garlic, turmeric, and scraped cocoanut.

Cursing. Swearing and cursing are offences against God and religion. By an Act of Parliament passed in the nineteenth year of the reign of George II., which repealed all former statutes on this subject, every labourer, sailor, or soldier profanely cursing or swearing shall forfeit 1s., every other person under the degree of a gentleman 2s., and every gentleman or person of superior rank 5s., applicable to the poor of the parish wherein such offence is committed; and on a second conviction shall forfeit double, and for every subsequent offence treble the sum first forfeited, with all charges of conviction, and (in default of payment) shall be sent to the house of correction for ten days. Any justice of the peace may convict upon his own hearing or the testimony of one witness; and any constable or peace officer, upon his own hearing, may secure the offender and carry him before a justice, and there convict him; but the conviction must be within eight days after the commission of the offence; and if either omits his duty, the justice forfeits £5 and the constable 40s. There is also a penalty of 40s. imposed by the "Town Police Clauses Act, 1847," and "Metropolitan Police Act," for profane language in the streets. Cursing, or wishing ill to the Sovereign, or doing anything to lessen him in the esteem of his subjects, or to weaken his government, is also an offence punishable by fine and imprisonment, and also corporal punishment. [BLASPHEMY.]

Cursorial Birds, a translation of the Latin *Cursores*, the single Order of Ratite Birds, containing the ostrich, rhea, emu, cassowary, and apteryx, and the extinct gigantic wingless birds of Australia, New Zealand, and Madagascar. [BIRDS.]

Curtesy, TENANT BY. Tenancy by the curtesy of England is the right and title which the husband possesses to enjoy for his life, after his wife's decease, lands of his wife of which she and her husband were seized in the wife's right for an estate of inheritance during her life, and where issue of the marriage is born which by possibility may inherit. By the special custom of gavelkind, a man may be such tenant by the curtesy without having had issue by his wife; but in this case he has only an interest in one-half of the lands, and he loses that if he marries again. There is no tenancy by the curtesy of copyhold lands, except by special custom, but the customs of copyhold manors vary considerably.

Curtis, GEORGE WILLIAM (1824-92), an American writer, who in 1850 joined the staff of the *New York Tribune*. From 1852 to 1869 he was joint editor of *Putnam's Monthly Magazine*, in 1853 took part in editing *Harper's Monthly*, and in 1857 of *Harper's Weekly*. In these magazines he published some novels, among them *Trumps* in 1862.

Curtis, SIR ROGER, British naval officer, was born in 1746, and became a lieutenant in 1771, a commander in 1776, and a captain in 1777. He rendered most valuable service during the defence

architecture. It is famed for boat-building. The population of the island is about 12,000, that of the town about 2,000.

Cuscuta. [DODDER.]

Cushat, a provincial name for the Woodpigeon (q.v.).

Cushing, CALEB (1800-1879), an American statesman, born at Salisbury in Massachusetts. He was called to the bar in 1821, and was a member of Congress from 1834 to 1843. In 1844 he negotiated the treaty between the United States and China, and, after commanding a regiment in the Mexican war, he was appointed U.S. attorney-general in 1853, retaining the post till 1857. He was U.S. counsel at the Geneva Conference in 1872, and was ambassador to Spain from 1874 to 1877.

Cushman, CHARLOTTE SAUNDERS (1816-1876), an American actress, born at Boston. She appeared in opera in 1834, and the next year she played Lady Macbeth. In 1844 she played in different parts of the States with Macready, and afterwards came to London. She played in high comedy and tragedy, among her characters being Lady Macbeth, Rosalind, Romeo (to her sister's Juliet), and Meg Merrilies. She retired in 1875.

Cusk. [TORSK.]

Cusp (Lat. *cuspis*, point of spear, etc.) denotes in astronomy the horn of a crescent, as for instance of the moon; in astrology the entrance of a house in the calculation of a nativity; in geometry, a point of a curve where the curve turns and goes in a reverse direction; and in architecture, the intersection of small arcs, and the figures resulting therefrom. The term is also used in anatomy, botany, and zoology.

Cusso, the inflorescence of *Brayera anthelmintica*; it contains a bitter resin, and is used medicinally as a vermifuge.

Cust, ROBERT NEEDHAM, an English writer and Indian official, born in 1821, and educated at Eton. He entered the Indian Civil Service, and, after occupying different posts in North India, became a member of the Legislative Council. He returned to England in 1869, and was elected member of several learned societies. He has written works on the languages of the East Indies, Africa, and Oceania, besides essays and sketches of Anglo-Indian life.

Custard (Fr. *croustade*, It. *crustata*, Lat. *crustatus*, from *crusta*, a pie or tart), strictly anything with a crust, but now denoting a kind of semi-liquid or quite liquid pudding made of eggs and milk, sweetened, spiced, flavoured, and boiled or baked.

Custard Apple, the fruit of various species of *Anona*, the genus of trees which gives its name to the order *Anonacea*, allied to the *Magnoliacea*. They are mostly natives of tropical America, though extensively cultivated throughout the tropics. In British India this name is applied to *A. squamosa*, which is also known as sweet sop or sugar apple. In America *A. muricata*, the sour sop, and in the

West Indies *A. reticulata*, the bullock's heart of India, is called custard apple. The trees are small, with scattered exstipulate leaves and a ternary perianth, having three sepals, six petals, indefinite stamens, and indefinite carpels. The latter become fused together into a large, many-chambered, fleshy, and juicy fruit, oval or rounded in form, and sometimes weighing several pounds. The fruit is more appreciated by natives than by Europeans.

Custom, a law not written but established by long custom by consent of the people. Customs are either general or particular. *General* customs are the universal rule of the whole kingdom (e.g. primogeniture) and form the common law in its stricter and more usual signification. *Particular* customs are those which mostly affect particular districts, as gavelkind in Kent. The courts are bound to take notice of general customs, but particular customs must be both pleaded and proved before they are judicially allowed. Moreover, a general custom is always good, but a particular custom in order to be good must be *reasonable, certain, compulsory, immemorial*, and *possible* in law. [COMMON LAW.]

Customs. Of old certain dues claimed for the Crown as of ancient right and custom. Then the word denoted any fixed toll, tax, or duty. The Prayer Book speaks of "accustomed dues." It is now generally restricted to the duties levied upon exports and imports. The adjustment of customs forms an important point in national finance, and in international relations. [FREE TRADE.]

Custos Rotulorum, the chief civil officer of the county to whose custody are committed the records or rolls of the sessions. He is always a justice of the peace and quorum in the county for which he is appointed. The lord-lieutenant has the chief military command of the county, and his office is quite distinct from that of custos rotulorum, but it is a usual practice to appoint the same person to both offices, in whom are united the highest military and civil authority in the county.

Custoza, an Italian village, 10 miles S.W. of Verona, notable as being the scene of two Italian defeats at the hands of the Austrians. Radetzky defeated Charles Albert in 1848, and in 1866 Victor Emanuel was defeated by the Archduke Albert.

Cutch, a native state of India, but under British protection, and situate in the Bombay government. It lies between long. 68° and 72° E., and lat. 22° and 25° N., and is bounded on the W. by an eastern branch of the Indus, on the S. by the Indian Ocean and the Gulf of Cutch, and on the N. and E. by the Runn of Cutch, which is a salt-water morass, hard and baked during the dry season, but forms a shallow lake during the monsoons. The interior abounds in hills, and from east to west runs an irregular mountain range, which is intersected with valleys which are sometimes fertile, but generally wild and barren and covered with jungle, and among them many petty chiefs have strongholds, from which they issue upon raiding expeditions similar to those which

formerly took place upon the Scottish border or in the Highlands. The country is liable to earthquakes, and as the rains are uncertain there is often famine. The water supply is scanty in quantity and bad in quality. Grain, cotton, and tobacco are the most important productions, and coal and iron are found, but not much used. The Runn of Cutch contains 8,000 square miles, and varies in width from 5 to 80 miles. The wild ass abounds in the neighbourhood. In the hot season the temperature is from 100° to 105°, and in the wet season there is much marsh fever, while in April and May violent sand and dust storms prevail. The capital is Bhuj, which is inland and surrounded by hills, and the chief seaports are Mandava and Mundra. There are many streams, but few remarkable rivers. The natives are rather a handsome race, and are much addicted to opium.

Cuthbert, St. (635–687), was born in Northumbria and educated at the ancient monastery of Melrose. The first Abbot of Melrose, Eata, came to Ripon and Cuthbert accompanied him. A difference with the English ecclesiastics as to the time of keeping Easter caused both to return to Melrose, where Cuthbert became prior. Eata was afterwards summoned to Lindisfarne and again Cuthbert went with him as prior. But Cuthbert longed for solitude and retired to Farne Island, whence he was summoned in 685 to the bishopric of Lindisfarne. In 687 he again retired to Farne, where he died. When the Danes made their inroads St. Cuthbert's relics were removed and finally lodged in Durham cathedral. He was to the north what St. Thomas of Canterbury was to the south, and his banner, said to have been used by him as an altar cloth, brought victory. It was carried at the battle of Brunanburh and at Flodden Field. It is now in the collection of the Pilgrimage of St. James, and is sent by the Venerable Bede to the continent about the year 1000. Cuthbert is the patron of the country and teaching his people.

Cuticle, in zoology, the continuous membrane extending over the entire body, consisting of a thin layer of cutin, which, as *cutin*, which is a polymer of chlor-zinc-iodide. The cuticle originates from the epidermal cells, and is composed of cellulose and chitin. It is the most and the thickest part of the body, and is a distinct layer, and is covered with hairs, and is the source of the secretion of the cuticle, which may exude a blue-grey substance. The cuticle agrees with the generic name of the cuticle, and is used in the larger kinds of cuticle. Although a fork

is not an edged tool, it generally comes under the head of cutlery, possibly for the sake of convenience from its relation to a knife. The Sheffield whittle was known to Chaucer, but it was not till much later that Sheffield really earned the reputation for cutlery which it now enjoys. The spring-back pocket knife seems to have been introduced early in the seventeenth century. Naturally swords were perfected at an early period in the history of cutlery. Much interesting information upon the forging, grinding, and handling of blades may be found in Charles Reade's *Put Yourself in His Place*.

Cuttack, the capital of the central district of Orissa, Bengal, at the point of the Mahanuddy delta, and 220 miles S.W. of Calcutta. It is noted for its gold and silver filigree work. The population of the district, which contains 3,157 square miles, is about 4½ millions.

Cutter, a small vessel with one mast and a straight running bowsprit. As now built, a cutter is rigged exclusively fore-and-aft, though at the beginning of the 19th century she had a square topsail. The rig is particularly suitable for yachts, and is also much favoured by pilot boats.

Cut-throat Finch. [CORAL NECK.]

Cuttlefish, the popular name of the Sepias or *Sepiidae*. The term is, however, often used more generally to the whole of the two-gilled Cephalopods, including the squids, devilfish, spirula, and paper nautilus (*Argonauta*). The true "cuttles," however, belong to the sub-order "Decapoda," and the section Sepiophora. They may therefore be defined as Cephalopods provided with a pair of gills (or branchiae) and an ink sac, a tubular funnel, a pair of tentacles in addition to the eight equal arms, and in which the skeleton is internal and calcareous, and has no phragmocone or only a rudimentary one. The shell or sepion, or "cuttle-bone," is the most characteristic feature. This consists of a flattish oval plate composed of numerous thin plates separated by small pillars; the whole is composed of carbonate of lime. At the lower end is a small sharp point known as the mucro; this is composed of very dense tissue, and it is hollowed out in front to receive a small chambered structure which is the rudimentary phragmocone. If the cuttle-bone be compared with a Belemniti (q.v.) the phragmocone may be seen in each, while the small mucro of the former represents the "guard," and the main mass of the sepion is equivalent to the delicate "proostracum." Owing to the thinness of the plates of which the cuttle-bone is composed, it is very brittle and easily rubs down into powder; it is therefore of much use as polishing material.

In regard to the structure of the soft parts, the cuttles do not vary much from the ordinary Dibranchiate Cephalopods. The body is generally rounded behind with a short blunt head bearing the ten arms; the mouth opens in the space between the bases of the arms. A fin runs all round the margin of the body. The skin or integument is generally of a light colour, but this varies

greatly by the expansion of the "chromatophores," small patches of pigment scattered all over the body. The arms are of two sizes; there are eight true arms, equal in size; these bear short suckers or "acetabula," by means of which the cuttlefish can firmly hold its prey; the remaining two arms are much longer, and are known as tentacles; they are concerned with the transmission of the male reproductive elements or "spermatophores" to the genital chamber of the female. The mouth is armed with a chitinous beak; the œsophagus is short and leads to a simple pyriform stomach at the hinder end of the body; the intestine is straight and opens to a "pallial chamber" on the ventral side of the animal; thence the excreta escapes through the funnel. The nephridia or kidneys and the ink sac also both open to the pallial chamber; the ink sac is a glandular organ which secretes a black-coloured pigment mixed with various mineral salts; by the ejection of a drop of this "sepia" the water is rendered so cloudy that the cuttle can effect its escape. The blood system consists of a large central heart from which the blood passes to two accessory or "branchial" hearts; these drive it to the gills, where it is aerated and returned to a pair of auricles and thus to the true heart. There are three main pairs of nerve ganglia; commissures from these form a collar round the œsophagus; the cerebral ganglia are enclosed in a cartilaginous capsule suggestive of a cranium.

The cuttle-fish are all marine; they live either crawling over the bottom of seas of limited depth or swim rapidly backward by the violent ejection of water from the pallial chamber through the funnel; they can swim gently forward by the movement of the lateral fin. The Sepias are now very widely distributed, though the number of genera and species is now somewhat limited. The oldest fossil forms occur in the Eocene system.

Cuvier, GEORGE, was born at Montbéliard, near Besançon, in 1769, and educated at the academy of Stuttgart. He became tutor in the family of the Comte d'Hericy, near Caen, in Normandy, where the Channel afforded him means of studying fish and mollusks. Here the Abbé Tessier discovered him and introduced him to the naturalists of Paris. He received in succession various professorial appointments, working with Lamarck and Geoffrey St. Hilaire, and astonishing his colleagues by the clearness of his lectures on comparative anatomy and his masterly use of the pencil. In 1796 Cuvier was one of the founders of the National Institute, of which in 1803 he was chosen a secretary. While issuing numerous separate anatomical memoirs on almost every group of the animal kingdom, Cuvier issued no separate work before 1812. In 1800 his pupil Dumeril issued two volumes of notes of his lectures as *Lessons on Comparative Anatomy*, which were supplemented by three others by Duvernoy in 1805. In 1812 appeared the first edition of the *Researches on the Fossil Bones of Quadrupeds*, a work based largely on the Eocene fossils from the gypsum beds of Montmartre, which may be said to have laid the foundations of vertebrate palæontology.

In 1817 many scattered memoirs were collected as *Contributions to the History and Anatomy of Mollusks*, and in the same year appeared the first edition of his most popular work, *The Animal Kingdom*. This was in four volumes, and was all his own work except the insects, in which he was assisted by Latreille. It contains the details of his classification of animals into Vertebrata, Mollusca, Articulata, and Radiata. In 1825 appeared the *Discourse on the Changes of the Earth's Surface*, Cuvier's chief contribution to general geology, and between 1828 and 1831 his *Natural History of Fishes*, produced in conjunction with Valenciennes. Cuvier, who had been entrusted with many important duties in educational administration by Napoleon, retained his position under the Bourbons, and in 1831 was made a peer of France by Louis Philippe. In 1832 he died. Besides innumerable contributions to descriptive and comparative anatomy, Cuvier introduced three main principles:—First, that of "correlation of growth," by which he first demonstrated the possibility of "reconstructing" fossil animals from mere fragments; second, that classification must be based not on external or physiological but on anatomical characters; and third, the substitution of a natural classification of animals for the artificial system of Linnæus. He thus did for zoology what the Jussieus and De Candolle did for botanical science.

Cuyp, a Dutch family which produced two painters. 1. JACOB GERRITSE (1575–1649), generally called the Elder, was born at Dort. His chief works were portraits and groups and animal life. He was realistic in treatment and somewhat stiff. 2. ALBERT (1605–1691), son of the above, was also born at Dort, and was a thorough Netherlander in artistic taste. His landscapes are generally taken from the banks of the Meuse and Rhine, and he delighted in rivers and meadows with groups of horses and cattle, stables, men and women on horseback, barges, and the like, the steeples and towers of Dort being generally visible in the background. He was very successful with reflections in water, and there is a certain tinge in his pictures which has caused him to be described as "blond." He has also painted some imaginative subjects, e.g. *Orpheus and the Beasts*. His *Riders with Boys and Herdsman* is in the National Gallery, London. He has been described as delighting in summer, noon, and calm, rather than in winter, night, and storm.

Cuzco, a town of Southern Peru, 11,000 feet above the sea, and capital of a province of the same name, which has a population of 238,000. The town is 350 miles S.E. of Lima, and was the ancient capital of the Incas, whose fortress still exists on a hill to the north. Cuzco is at the head of a fertile valley, and has fine buildings, many of them being in the lower parts the work of the Incas. There is a good cathedral. Cotton, leather, linen, sugar, are among the productions, and there is good gold and silver work. A remarkable feature of the neighbourhood is the slight bridges which are carried over ravines. Of the population a great proportion are Indians.

Cyanates are compounds derived from *cyanic acid*, HCNO , by replacement of the hydrogen by some other element or group of elements. The *isocyanates* form a series of compounds of the same composition, but differing in constitution. [ISOMERISM.] Both classes of substances are of considerable chemical, though of little general, interest and importance.

Cyanic Acid. [CYANATES.]

Cyanides, a class of substances which may be regarded as derived from *hydrocyanic* or *prussic acid*, HCN , by the substitution of other elements, or "radicals," for the hydrogen. Of the metallic cyanides, potassium salt, KCN , is of great importance industrially, being largely employed in photography and electro-plating. It also finds constant application in metallurgical and chemical operations. The metallic cyanides are all poisonous, some being as strong as prussic acid itself. They are manufactured chiefly by heating carbon, nitrogenous matters, and a metallic, usually potassium, carbonate. Other methods are also employed in which the atmosphere is used as the source of the nitrogen. Cyanides may be detected by heating with yellow ammonium sulphide, and adding a ferric salt to a drop of the distillate, when a fine blood red coloration results. A large number of "double cyanides" exist—i.e. compounds in which two metals are present, as e.g. potassium ferrocyanide (prussiate of potash). The organic cyanides (ethyl cyanide, etc.) have the same composition as the *Carbamines* (q.v.), the difference in their substances being explained by the supposition that their constitution is as indicated by the formulae.

XCN , cyanides; XNC , carbamines.

Cyanogen, C_2N_2 , a gas which may be prepared from gold, silver, or mercuric cyanide, or from potassium cyanide, and burnt in oxygen. It is condensed by pressure (21 atms.) to a colourless liquid, which is soluble in water, but the solution is unstable, and decomposes to a small extent. It has many chemical relations, especially to chlorine and bromine, and is a "radical," CN , in many compounds, particularly in the investigations of Gay Lussac, and in the "radical" theory of chemistry.

CN , a gas which may be prepared from gold, silver, or mercuric cyanide, or from potassium cyanide, and burnt in oxygen. It is condensed by pressure (21 atms.) to a colourless liquid, which is soluble in water. It is found, however, in its natural state, as many analogies to the cyanide group, or "radical," CN , in many compounds, particularly in the investigations of Gay Lussac, and in the "radical" theory of chemistry.

Cyanomaceæ, a small group of plants, allied with the *Cyathocrinus* (q.v.), and from the adaxial side of the stem. They are known in the fossil state, and are characterized by their pinnate leaves, or by their small, or as endo-phytes, Sphagnum, and are divided into two groups, including

such forms as *Glæocapsa*, which are mostly in gelatinous colonies formed by the swelling up of parent cell-walls; and the *Nostocaceæ* (q.v.), in which the cells are united into filaments.

Cyanosis, blueness or lividity of the skin (Gk. *kyanos*, blue), is a symptom common to certain diseases of the heart and lungs, in which there is an interference with the due aëration of the blood. Cyanosis in a marked degree is a particularly characteristic symptom of congenital malformation of the heart.

Cyathocrinus, one of the best known genera of the Sea-lilies of the Palæozoic era. It is the type of the family *Cyathocrinidæ*, and it ranged from the Silurian to the Carboniferous periods. It belongs to the group "Inadunata," as the arms are quite free above the dorsal cup. The calyx was small, and the plates loosely attached; hence, they readily fell to pieces on the death of the animal. The stem was large, cylindrical, and composed of many thin ossicles, or joints. The genus was especially common in the Upper Silurian of the Wenlock district, from which locality the best English specimens are derived.

Cyathophyllum, one of the best known genera of the corals of the extinct group, the "Rugosa" (q.v.). It was common in the seas of the Silurian period, and survived till the Carboniferous. The corals of this genus are generally single, and of a curved and inverted conical form. Some species, however, were compound. The genus is the type of the family *Cyathophyllidæ*, which is of interest, as some recent corals may have to be included in it.

Cycads, an order of Gymnospermous plants in several respects closely related to ferns, which, though now only including some seven genera and about fifty species, played a leading part in the vegetation of Lower Secondary times. They have tap-roots: columnar, generally unbranched, stems, of no great height, with a large pith and broad medullary rays, and marked externally by leaf-scars; terminal crowns of large rigid pinnate circinate leaves, which, it has been suggested, however, may have some of the characters of branches; and dioecious flowers with elongated axes, closely resembling the sporangiferous "spikes" of some of the higher cryptogams. The male flowers consist of peltate sporophylls (stamens) in whorls, like those of *Equisetum*, bearing numerous microsporangia (pollen-sacs), the microspores (pollen-grains) in which are distinctly multicellular, having a group of "included cells," or male prothallium. The female sporophylls vary, those of *Cycas* being pinnate leaves with their lower lobes transformed into large ovules (macrosporangia), whilst those in other genera are peltate and bear only two ovules each. The seeds are albuminous, and the number of cotyledons varies. Most cycads form large quantities of starch in their pith, from which native substitutes for sago are prepared in Japan, the Moluccas, the West Indies, and South Africa. The genus *Encephalartos* gets its name of Caffre-bread from this fact. The "fossil

crows'-nests" of the quarrymen in the Isles of Portland and Purbeck are the stems of *Cycadææ*.

Cyclamen, a small genus of *Primulaceæ* (q.v.), mostly natives of the Mediterranean region, but represented by one rare species, *C. hederæfolium*, in England. They have a large corm, which, though acrid, is eaten greedily by swine, whence the English name Sow-bread. The leaves are radical, petiolate,



CYCLAMEN (*Cyclamen hederæfolium*).

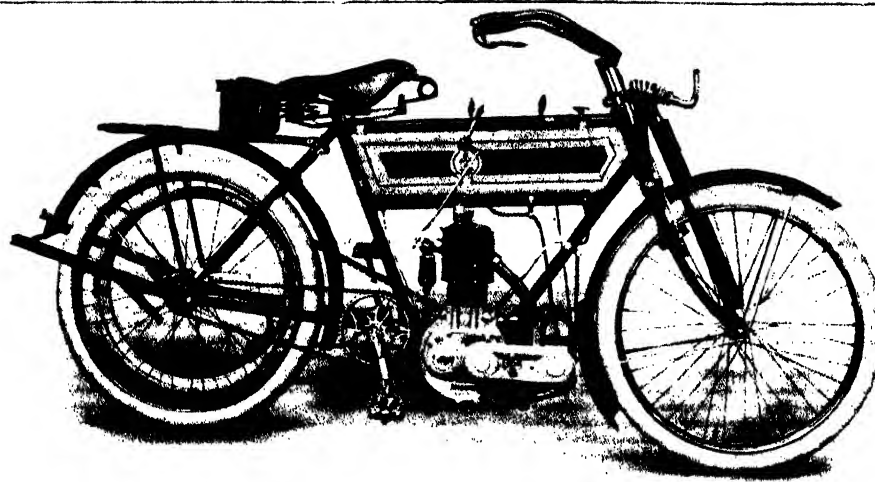
cordate, and often marbled with greyish-white, and the flowers form one-flowered scapes with curved peduncles. The lobes of the corolla are curiously reflexed and twisted, and after flowering the peduncle often bends down until the capsule is either on or in the ground. *C. persicum* and others are favourite greenhouse flowers.

Cycle (Gk. *kyklos*, circle), anything round, but generally used in some special sense of a recurring in motion or time, for instance, the orbit of a planet, or a period after which the order of days recurs. Sometimes it means simply an age or lengthened period as in Tennyson's phrase, "Cycle of Cathay." The word is used in physics, in literature—to denote a set of tales or poems grouped around a certain event—and in botany. Among well-known cycles are the Chinese, Chaldean, Solar, and Paschal cycles. As a verb, *cycle* meant to circle round, and the word has been applied to denote progression upon a bicycle or a tricycle.

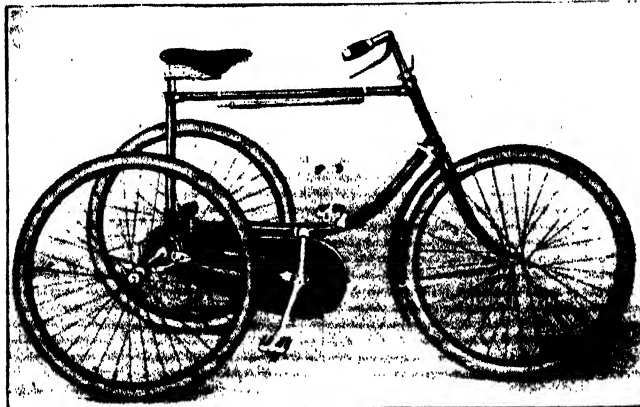
Cycling, a sport which bids fair to assume national importance in the British Isles. The bicycle in its various developments has enabled man by the use of his muscles alone to progress at greater speed, and with less fatigue, than has ever before been possible. The word bicycle is incorrect in formation, meaning two circles, and has been shortened to "cycle," whence the verb, "to cycle." The earlier progenitors of this modern machine were the various velocipedes, dating from the latter end of the 18th century, if not from the 17th, inasmuch as in 1691 John Greene took out on June 12th a patent for "new engines or carriages, driven or drawn by man or beast." In 1766 John Vever, then head-master of the school "at Reigate in Surrey," invented "a travelling chaise to go without horses," the vehicle in question being a veritable four-wheeled coach, steered by a passenger and propelled by a footman, who operated levers from the rear. Very wisely the inventor

added: "The velocity of these carriages depends on the activity of the managers." Most of these vehicles were termed, with unconscious sarcasm, "self-moving carriages." In 1779 an improvement or development of John Vever's patent was produced by MM. Blanchard and Messurier, and exhibited in the courtyard of the palace of Versailles before Louis XVI. and Marie Antoinette. Many such vehicles were tried, but in almost every case the labour was to be done by a footman or attendant, who was in some cases called upon to propel a heavy carriage and seven passengers, in addition to his own weight. It was not until the beginning of the 19th century that the principle of balancing upon two wheels, one in front of the other, found practical development, and the earlier developments were, of course, extremely crude. The invention of what was known in later times as the Dandy Horse is usually credited to the Baron Drais de Saverbrun, Master of Woods and Forests to the Grand Duke of Baden, who was in 1818 resident at Mannheim-on-the-Rhine, and who there made and rode a vehicle known as the Draisene, Draisienne, or Draisena. This was patented in France in the same year by Louis Joseph Dineur, on February 17, 1818. The Baron died in 1851. The Draisene consisted of a bar of wood called "the perch" in England, carrying a pair of forks at each end, in which the two small wheels ran. The front pair of forks turned in a socket in the perch, and was guided by a handle which the rider grasped with both hands, a cushioned bar for the rider to lean his chest upon was provided in front of the saddle, and the rider progressed by striking his feet alternately on the ground on either side. A fair amount of speed could be attained on the level and, of course, down hill. The machine was done to death by the caricaturists, who never lost a chance of ridiculing the "pedestrian currie."

The priority of Von Drais' invention has been questioned, as in 1816 Nicéphore Niepce, of Paris, in collaboration with his brother, Claudelle Niepce, resident at Hammersmith, produced a machine on much the same lines as the Draisene, called the celeripede. This was frequently ridden in the gardens of the Luxembourg, but may possibly have been copied from the Mannheim machine. In 1818 Dennis Johnson, a coach-maker, of Long Acre, London, introduced to the public his "Pedestrian Currie," and this vehicle had a brief vogue, and was known as the "Hobby Horse" or "Dandy Horse." Important as were the principles involved, the "Dandy" failed to hold its own, though Dreuze in France mounted Government messengers upon them in 1830, whilst in 1836 Michael Faraday astonished the inhabitants of Hampstead by riding one, and the Duke of Northumberland and others used them. In or about the year 1840 a little group of riders of the Dandy Horse lived near Dumfries, and one of them conceived the idea of putting cranks upon the rear wheel, and connecting them with swinging bars, which could be put in motion by the feet. For the first crank-driven bicycle, the credit—hitherto given to Gavin Dalzell, a cooper of Lesmahagow, based mainly upon the survival of his original



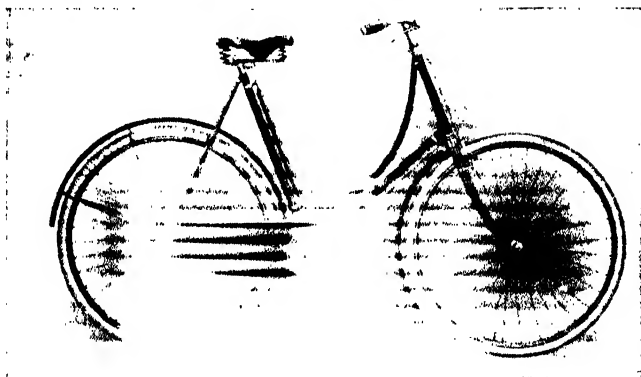
MOTOR BICYCLE. (Supplied by Triumph Cycle Co., Ltd.)



A "BEESTON-HUMBER."

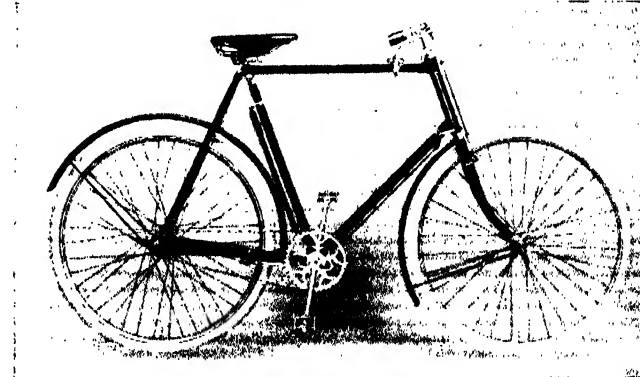


CARRIER.

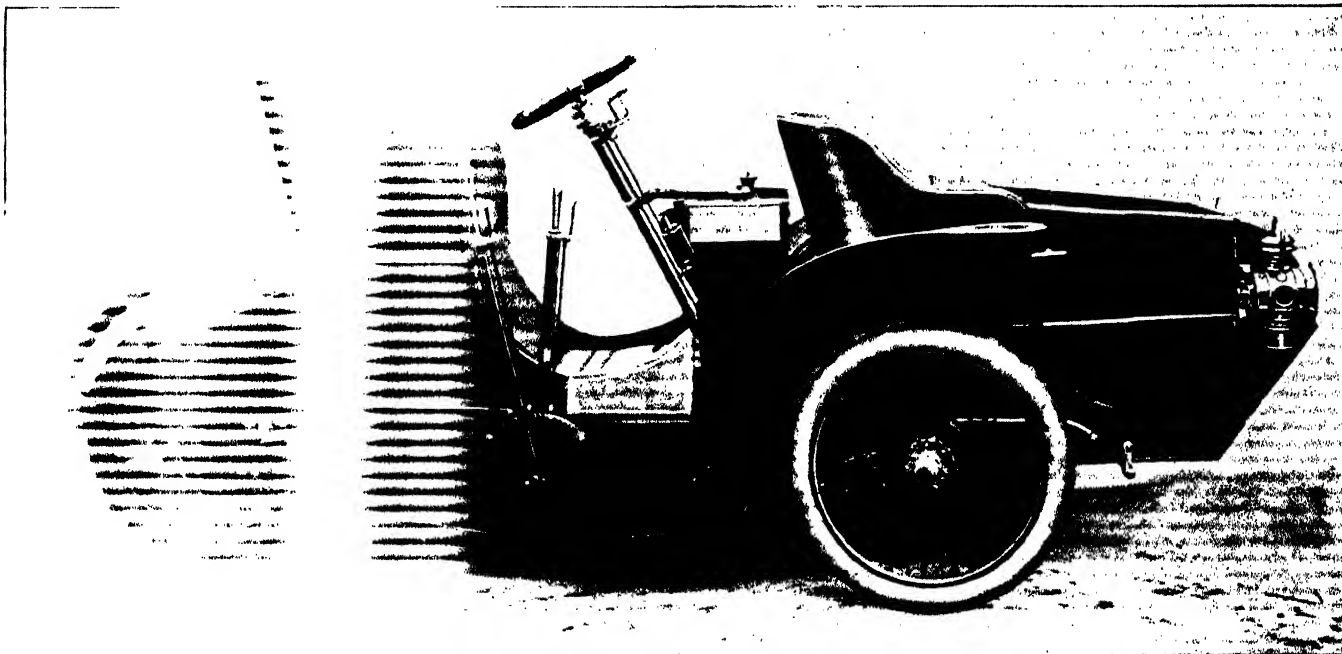


LADY'S

(Supplied by Humber Co., Ltd.)



GENTLEMAN'S CYCLE. (Supplied by Humber Co., Ltd.)



MOTOR TRI-CAR. (Photo supplied by Triumph Cycle Co., Ltd.)

and, this was accomplished by results as regards the road for many years. The Dwarf, or so-called the tricycle, was not a success from a mechanical point of view, proved slower and more expensive than the invention of the tricycle. In 1885, he patented a tyre with a depression, and this was improved by Mr. Dunlop, and afterwards in their first crude, and the

The sport owes much of its advancement and almost all improvements in the direction of lightening the machine to the publicity and experience gained by and on the racing path. Here the

machines, reduced to the lightest possible weights, are tested in the most thorough manner, and the light racer of to-day is the roadster of to-morrow. The best recorded times are constantly being altered, and any figures given might soon be obsolete. Suffice it to say that a quarter-mile has been ridden in $27\frac{1}{2}$ seconds with a standing start, that one mile has been covered in 1 minute $1\frac{1}{2}$ seconds, that over 45 miles have actually been covered in 60 minutes, and that a distance of over 630 miles in 24 consecutive hours has been ridden. On the road, moreover, 428 miles have been covered in 24 hours; 100 miles have been ridden in four hours sixteen minutes thirty-five seconds.

The Land's End to John o' Groat's record is under three days.

Among the fastest tracks in Europe—probably in the world—are those to be found in the grounds at the Crystal Palace and Herne Hill. The oldest club is the Pickwick Bicycle Club, dating from June 22, 1870; no other club has had so long a continuous existence. The Stanley Cycling Club is one of the most active and energetic organisations, promoting each year the great Stanly Show, while the Cyclists' Touring Club has a very large number of members. The most prominent Midland Club is the Speedwell Bicycling Club, and the most active purely racing organisation is the London County Cycling and Athletic Club, Limited.

There are a number of publications wholly, or in part, devoted to cycling. For many years the pastime was practised in England in the face of much ridicule and hostility, but prejudices have been overcome, and cycling has obtained a firm hold upon the public, and is daily becoming more general. A large number of ladies ride cycles, many good schools exist for the proper teaching of the art, and those who are unable to attend such institutions can easily learn by following out carefully the instructions contained in any one of the many text-books published. The gist of the whole, however, may be crystallised into one sentence:—"Turn the steering wheel *towards* the side to which the machine is falling." Carry this out, and the cycle is mastered. Dress is a very important item, and needs careful attention. Here, again, the maxim is short and easily remembered:—"Wear nothing but wool." So garbed, the rider, however uncomfortable he may be, will not be in serious danger; the smallest patch of linen will strike cold and chill him. Special shoes are necessary, they should open a long way down, have a stiffened sole and be cut high over the front of the foot. Intelligently followed, cycling is a safe and healthy recreation, a convenient method of travelling, and an enjoyable and exhilarating pursuit.

Cycloid is the curve generated by a point on the circumference of a circle that rolls along a straight line. Its area is three times the area of the generating circle.

Cycloid Scales are scales not covered with enamel, and having a concentric striation and the front margin entire. When this margin is furnished with comb-like teeth the scales are called Ctenoid. [FISHES.]

Cyclone (Gk. *whirling*) is the name used to describe the general kind of storm which moves in a circle, or rather in a succession of intersecting spirals round a steadily advancing centre. The word is also used as synonymous with *hurricane* and *tornado*.

Cyclopes. 1. Mythological beings who worked with Vulcan in his Ætnean forges, and who probably were the volcanic agencies of the district personified. They were three in number, and were confined by Kronos beneath the earth. Zeus set them free to battle for him against the Titans, and gave them thunder and lightning. 2. An imaginary race, more in number than those last mentioned, who came from Lycia, and built Mycenæ and executed other colossal works, giving rise to the expression *Cyclopean walls*. 3. The Cyclopes of Homer, who were shepherds, and who were connected with the sea, Polyphemus, the antagonist of Ulysses, being the son of Neptune. A point of resemblance in them all was the one eye in the middle of the forehead.

Cyclops, the best known and most typical of that group of Crustacea known as the "Copepoda" (q.v.). *Cyclops* is very common in most English ponds and fresh waters, and may be readily recognised by its large single eye in the middle line towards the front of the head; its five pairs of two-branched swimming feet, usually provided with bristles; and the pair of large bottle-shaped ovisacs carried by the female. The form is also typical: it is cylindrical, bluntly rounded in front, and tapering gradually behind; the tail is two-lobed. Cyclops has a very rapid, darting movement. The species are fairly numerous, but are all small. *Cyclops quadricornis* is a representative species, and attains on an average a length of about a fifteenth of an inch.

Cyclostoma, a delicate univalve shell abundant in limestone districts in the South of England. It is of interest, as it is the only English land Gastropod (q.v.) which is provided with an "operculum," by means of which it closes the mouth of its shell. *Cyclostoma elegans* is the English species.

Cyclostomata (*round-mouths*). 1. A class of Vertebrates having no true jaws or limbs. Examples are the Hag-fish and the Lamprey, both which see. 2. A sub-order of Bryozoa (q.v.), in which the colony has a calcareous skeleton (zoarium) composed of long tubes. These open by a terminal orifice which is the same size as the tubes. They are the simplest of the three principal sub-orders of living Bryozoa, but are now less important than they once were. The English species only number a little over 30, though they were more abundant in the Chalk and Oolitic seas. The *Crisiidae* and *Tubuliporidae* are the two principal living English families, but representatives of them are rare in comparison with the Cheilostomata.

Cydippidae, the family of *Ctenophora* (q.v.), including all the English species of the tentacle-bearing group. *Pleurobrachia* (q.v.) is the best known English representative of the family.

Cypres (*as near as, so near*). In cases where a perpetuity is attempted to be created *in futuro* there is an essential difference between a deed and a will, for in the case of a deed all the limitations are absolutely void, but in the case of a will the courts, if it can possibly be avoided, do not construe

the devise as utterly void, but allow the will to be explained in such a way as to carry the testator's wishes into effect so far as the rule respecting perpetuities will permit, which is termed a construction "cypres." For example, where a life interest is given by will to an unborn person, with remainder in tail to the child of such unborn person, the courts will give the estate tail to the first unborn person in lieu of his estate for life, so as to leave to the second unborn the chance of the estate tail in that way descending upon him, which it will do if not barred. Cypres does not apply to personal property, there being no estate tail in such property. [CHARITY, PUBLIC.]

Cypress (*Cupressus*), a genus belonging to the sub-order *Cupressineæ* of the order *Coniferae*. They have minute, scale-like leaves, generally overlapping in four rows; minute, elongated male flowers; and small rounded cones made up of from six to ten pelate woody scales, with a curved point in the centre of each, and numerous winged seeds in the axil of each scale. *C. sempervirens*, the common cypress, is a native of Persia and the Levant, its commoner variety (var. *fastigiata*) resembling the Lombardy poplar in outline, and reaching, in its native country, 70 to 90 feet. Its timber is hard, reddish, and very durable, and was used by the ancients for mummy-cases, statues of the gods, tables, cabinets, musical instruments, and building purposes. In Turkish cemeteries it is the custom to plant a cypress for every burial, and its dark-coloured foliage and "architectural" form give it a very funereal aspect. The largest known specimen is that at Somma, in Lombardy, 121 feet high and 23 feet round, supposed to be older than the Christian era. The other variety, *C. horizontalis*, spreading like a cedar, is less commonly planted in England. *C. Lawsoniana*, a beautiful tree, native of California, where it reaches a height of 100 feet, was introduced into Britain in 1854, and other Californian species are now grown, but cypresses seldom exceed 40 feet in height in Britain. *C. glauca* or *C. lusitanica*, the "Cedar of Goa," has been extensively planted round Cintra and elsewhere in Portugal. The name Deciduous Cypress is given to a very different coniferous tree, *Taxodium distichum*, which forms the cypress swamps of the Southern United States, and is perfectly hardy in England, reaching 50 feet or more in height. It has short twigs bearing minute leaves in two rows (distichous), the whole being feather-like in appearance, turning a bright russet or pink in autumn and falling off whole.

Cyprian (200-258), a noted Bishop of Carthage and martyr. He was of a patrician family and was wealthy. For some time he taught rhetoric at Carthage, and delighted to engage in controversy with the Christians. But Cœcilius, whose name he took, baptised him in 245, and he gave his wealth to the poor. He was made bishop, and ruled wisely and well. In 250, during the Decian persecution, he had to retire from Carthage. After this persecution he took a great part in the controversy as to the treatment of the Lapsi—those who had denied their faith during the persecution and now

desired to be reconciled to the Church, and he was an advocate for leniency towards them. In the persecution under Valerian he was banished, and being afterwards made prisoner he was commanded to sacrifice, and on his refusal to do so was beheaded. Many interesting letters of his are extant, and among them are letters to Cornelius and Stephen—Bishops of Rome—whom he styles "colleagues." Some of his letters show that he had strong poetical feeling, and that he was keenly alive to scenery and the beauties of nature.

Cyprinidæ. [CARP.]

Cyprinodontidæ. [CARP.]

Cypriots, the primitive inhabitants of Cyprus, originally Aryans, and most probably immigrants from Lycia, in Asia Minor, akin to the Hellenes, afterwards largely mixed with Phœnician elements, and ultimately Hellenised. The Cypriot language was distinct from Greek, and written in an archaic character, closely resembling that of the Lycian monuments, and in which each character represents a syllable and not merely one sound. Hence it is of importance in the history of writing. Its best relic is the bronze tablet of Dali, found about 1850, near the site of Idalium, and containing a perfect inscription of 30 lines. At the last census (1901) the population was 237,022, of which 184,000 were Greeks and Maronites, the rest nearly all Turks.

Cypris, the commonest English genus of that group of "Water Fleas" known as the Ostracoda (q.v.), one of the orders of the Crustacea. *Cypris* abounds in fresh water, in which it swims by means of a pair of set or covered appendages at the abdominal end. The animal is protected by a small bivalved shell, composed of a horny material, and oval or kidney-shaped in form. The shells of the Cyprids accumulate in such abundance in the bottoms of the ponds in which they live that the mud is rendered quite fissile; the clays of the Wealden and parts of the Purbeck beds are thus easily broken into thin slabs. There are about 30 English living species.

Cyprus, in the east of the Mediterranean, and the third in size of the islands of that sea. It is 1,000 miles E. of Malta, and almost equidistant from Asia Minor on the N. and Syria on the E., being 40 miles from Cilicia and 60 miles from Latakiah, and is in the latitude of Crete. The length from Cape Drepano on the W. to Cape St. Andrea in the N.E. is 145 miles, and from Cape Gata in the S. to Cape Kormatiki in the N. 60. The average width is from 35 to 60 miles, but for 45 miles to Cape Andrea it has a tongue of land 10 miles wide. The island contains 3,707 square miles. There are two mountain ranges—one in the south, having the general name of Olympus, of which the highest peak is Mount Trodos, 6,590 feet in height, sends off spurs in various directions. The Olympus of the ancients was probably a not very lofty but conspicuous height now called Oros Stavro, 12 miles from Larnaca. The second range is a northern range along the coast from Cape Kormatiki to Cape St. Andrea, 100 miles in length, with an average height of 2,500 feet. The middle

district of Messaria is a broad plain of 60 miles long by 10 to 20 broad, watered by two streams from the south, one flowing to the Bay of Famagosta and the other to the Bay of Morphu. Owing to the disappearance of the ancient forests which provided timber for the Roman fleets, the rivers run dry, water is scarce, and much of the land is barren, though corn is produced in places. In olden time Cyprus produced much copper, to which indeed it gave its name in Latin, as well as silver, and Pliny speaks of its producing precious stones. There are still salt-works, but the mineralogy and geology of the island have not yet been fully explored. Of harbours there are none of importance, Larnaca and Limasol, the chief ones, being only roadsteads. The chief towns are Nikosia, the capital, Famagosta (anciently Salamis), the chief town under the Venetian rule, and well defended against the Turks in 1571, Larnaca, on the south-east coast, the chief place of trade and the most rising town of the island; Limasol on the south coast, and Paphos (which has a bishop). The history of Cyprus has been eventful. At first it was a Phœnician possession and the seat of the worship of Astarte, and then it became the seat of the worship of Aphrodite, with Paphos as its headquarters under Greek rule. It was then successively Egyptian, Macedonian, Persian, and Roman, and was a great stronghold of early Christianity. Later it fell under Saracen sway, and then Richard I. gave it to Guy de Lusignan. It then became Venetian, and then Turkish, and in 1878 was taken over by England to be administered for the Porte until Russia should retire from Kars and Batoum, till then held by Turkey. England in return pays the Porte £50,000 a year, a sum which exceeds the surplus income of the island, which has to be supplemented by a grant. The chief products are wheat, cotton, barley, flax, wool, oranges, pomegranates, &c. England has not done much for the island, and making the forests nearly good, and much of the land is still in the early stages of improvement. The island may be attributed to an injury done by the Turks for camping.

[CYPRIOTS

Cypsel. the name of the *Composita*

Composita consists of two species, one-seeded, small in size. It is found in the thistle, but not in the hairs or *pappus* of the achene, but the seed is made up of

Composita Classification a

Composita [SWIFT.]

opening a box, is the name of the great order consists of two species, one-seeded, small in size. It is found in the thistle, but not in the hairs or *pappus* of the achene, but the seed is made up of

Composita Classification a

Composita [SWIFT.]

Eocene and older rocks indicates their estuarine formation. *Corbicula fluminalis* is a close ally of *Cyrena*; it is very common in the gravels of the London area, and survives only in some rivers in the eastern Mediterranean.

Cyrenaica (the Pentapolis of Roman times) is a district of Africa exactly opposite to Greece, about 250 miles in length, and extending inland for 80 miles. It is protected from the winds of the Sahara by mountains which slope gradually to the sea, presenting a very varied climate and temperature, and producing most of the fruits of tropical and temperate climates, corn, wine, perfumed flowers, and a plant called silphium, for which the district was noted in ancient times. Kingsley in his *Hypatia* speaks of the wheat ships of Pentapolis. Originally colonised by Spartans, it afterwards became a Roman province. Constantine gave it the title of Libya Superior, and it was then a highly important possession. In the seventh century it fell into the hands of the Arabs.

Cyrene, the capital of Cyrenaica, was founded in 631 by Battus the Spartan, whose dynasty reigned for 200 years as had been prophesied by the oracle of Delphi. It then became a republic and fell with the rest of the district under the Roman rule. The intellectual life of Cyrene attained a high standard. The town was renowned for its school of medicine; it produced Callimachus, the poet; Carneades, the founder of the Athenian New Academy; Aristippus, the founder of the Cyrenaic School; and last, though not least, the kindly and eccentric bishop Synesius, the friend of Hypatia, whose charming character and noble disposition have been well portrayed by Charles Kingsley. Many magnificent ruins and a number of hill-tombs testify to the former importance of Cyrene.

Cyril, St. (376-444), a militant bishop of Alexandria who was more noted for zeal than discretion, though doubtless allowance must be made for the troublous times in which his lot was cast. The measures for which he is chiefly memorable were the closing of the Novatian churches and the seizure of their treasures, the expulsion of 40,000 Jews upon a charge, possibly true, of ill-treating Christians, and his struggle with the time-serving governor of Orestes which culminated in the murder of Hypatia, the fair and famous neo-Platonic professor and lecturer. Charles Kingsley in his *Hypatia* gives a vivid picture of the times, and shows what a formidable instrument of aggression St. Cyril possessed in his army of fierce monks, but it is doubtful whether he has not allowed the more objectionable features of Cyril's policy to blind him to the difficulties he had to contend with. In later years the bishop's impetuous energy calmed down, and his opposition to the Nestorians was confined to writing against them and procuring their condemnation at the Council of Rome in 430, and at that of Ephesus in 431. With a view to ending the controversy the emperor Theodosius arrested both St. Cyril and Nestorius. When restored to liberty St. Cyril passed the rest of his life in peace. He has left numerous writings, vigorous in style, and many of them polemical in

Czartoryski, a famous Polish princely family name, the most noted of the family being CZ. Adam George (1770-1861). He was born in Warsaw, and after an education in England he went home, and in 1792 took part in a campaign against the Russians. After the partition of Poland (1795) he was sent with his brother Constantine to St. Petersburg as a hostage to Catherine II. Here the Grand Duke Alexander became his friend, and in 1797 Paul I. entrusted him with an embassy to Constantinople. When Alexander became Czar in 1802 he made his friend Foreign minister, and in

this capacity in 1805 Czartoryski signed the treaty between England and Russia. For some motive he took no part in Napoleon's movement in favour of Poland, and in 1814 he was with Alexander in Paris. He was not, however, without patriotic inclinations, and in 1815 he, as head of the University, upheld the students of Wilna against Russian oppression. He lived in retirement from 1821 to 1830, but in 1831 he was made supreme governor of Warsaw. He boldly told Czar Nicholas that his policy would lose him Poland, but there was no love lost between the two, and the Czar later confiscated his lands. In consequence of his dissatisfaction with the state of Russia Czartoryski came to Paris, but he was distrusted by his compatriots, and though part of his lands were confiscated in 1846, and he emancipated his serfs in 1848, the Polish colony had no real confidence in him, and he had no great influence among them. He died in Paris.

Czaslau, an Austrian town of Bohemia, 40 miles S.E. of Prague, of the government of which it forms part. A notable feature of the town is its church with a tall spire. Here the Hussite chief, John Ziska, was buried. The town was also the scene of a Prussian victory over the Austrians in 1792. The country around is mountainous but fertile, with extensive pastures.

Czegled, a market town of Hungary, 50 miles S.E. of Pesth, in an agricultural and wine-growing district.

Czenstochan, a Polish town in the government of Warsaw, on the Warta, near the Silesian frontier, and near the Warsaw and Cracow railway. Just outside is a convent noted for its miraculous picture of our Lady painted (so says tradition) by St. Luke upon a panel furnished by St. Joseph. Many pilgrims visit this picture. The monks were expelled in 1867 upon political charges. The town made a brave defence against the Swedish army in 1655.

Czernowitz, an Austrian town on the right bank of the Pruth, in the government of Lemberg, and about 400 miles from Vienna. It is the seat of a Greek bishopric. There are many goldsmiths and jewellers, and the district produces leather, metals, and raw material. The country round consists of outlying spurs of the Carpathians, and contains large forests. Wheat and flax are grown, and silver, iron, and copper are found.

Czerny, KARL (1791-1857). pianist and composer, and son of a professor of music, was born at Vienna. At the age of ten he showed such proficiency that he was taken in hand by Beethoven as well as by Sebastian Bach and Clementi. But for much of his life he gave all his energies to his pupils, some of whom achieved brilliant success, and though he published at thirteen, his productive powers slept till he was forty, when he made up for lost time, and produced no less than 800 pieces. He also wrote a *Practical School of Composition*, and an *Outline of a History of Music*.

Czerny-George, PETROVITCH (1779-1817), the

liberator of Serbia, is said to have been of French origin, and to have derived his name from his swarthy hue. Brought up as a peasant, he killed a Mussulman oppressor and fled to Transylvania for refuge. He served in the Austrian army against the Turks, but having to leave the Austrian service through some infraction of discipline, he turned bandit. This life not suiting him, he was soon serving again in the Austrian army. He then went to Serbia, where he was a prosperous cattle-breeder, and became very popular. The pasha of the district was murdered by the janissaries. Czerny headed a successful movement against the janissaries, and his action gained the approval of the Sultan—an approval, however, which changed into disgust when he found Czerny extending the movement to the securing of Servian independence subject to the suzerainty of Turkey and a tribute to Constantinople. But this freedom once secured, Czerny seems unaccountably to have lost all energy, and his intrepidity turned to vacillating timidity. As a result of this weakness his enemies made head against him, and he was strangled and his head sent to Constantinople.

D

D, the fourth letter of the alphabet, derived from the Chalkidic form of the Greek delta (Δ) adopted by the Romans from the Sicilian Greeks. [ALPHABET.] The Greek Δ occurs also as \triangleright in the alphabet of Corinth. It is probably derived from a hieroglyphic representing the triangular doorway of a tent. The Roman D is the numeral sign for 500. In music D is the second note of the natural scale.

Da Capo (Ital. *from the beginning*), in Music, is printed at the end of the second part of an air with two parts, to signify that the first part must be repeated as a conclusion. Another form of it is DAL SEGNO (*from the sign*).

Daan, a term applied to three different Berber peoples in Algeria, who are respectively distinguished as Uled Sgar, Uled Bedar, and Uled Ghamrez Daans. They occupy a mountainous region some 20 miles south-east of Guelma, about the headwaters of the Melah, affluent of the Seybouse. All are closely-related members of the Shawiya branch of the Berber family. The Uled-Dhans of Ken-nugha, near Mount Shukehof, belong to the same connection. In their territory are some Roman ruins in the neighbourhood of several still frequented thermal (sulphurous) waters.

Dab (*Pleuronectes limanda*), one of the commonest of the Flat-fish (q.v.), found on all the Northern coasts of Europe. It is rarely more than a foot long; the general hue of the upper surface is light brown with dark spots. It frequents smooth, sandy bays and feeds on small marine animals. The flesh is better flavoured than that of the plaice or flounder. *P. microcephalus*, the Smear, Lemon, or Smooth Dab, ranging to Scandinavia and Iceland, is rather larger, and is also valued for the table.

Dabchick, a popular name for the Lesser Grebe. [GREBE.]

Dacca, a city and district of Bengal. The district, containing about 2,797 square miles, consists for the most part of mountainous land and of level plain intersected by a network of rivers and watercourses, forming in the wet season almost an inland sea, dotted here and there by island farms protected by dykes, and presenting features familiar to those who know the Low Countries. About two-thirds of the area are under cultivation, producing among other things indigo, rice, jute, cotton, and sugar-cane in such profusion that the district has obtained the name of the "granary of Bengal." It has extensive forests well stocked with elephants and tigers and other wild animals, and its inhabitants are noted as adventurous boatmen. Owing to the excessive moisture, the country is fertile in dysentery, goitre, fever, with occasional visitations of cholera and small-pox. Earthquakes, too, are not uncommon. Of the population, which exceeds two millions, about sixty per cent. are Mahometan. The city, which is on the bank of a small river uniting the Ganges with the Brahmaputra, lies about 150 miles N.E. of Calcutta. From 1610 to 1704 it was the seat of the Mahometan government of Bengal, and the ruins of mosques and other buildings in the neighbourhood bear witness to its former extent. It once had a great renown for its muslins, but English manufactures beat it out of the field, and from a population of 200,000 at the beginning of the 19th century it fell to 68,000 in 1838. By reason of its command of the waterways of the delta it is well situated for commerce, and it now has good schools, a hospital, and waterworks.

Dachshund (from *dach*, *hunden*, dog), a breed of dogs introduced into England since Albert about 1850. They are of the *Taxidea* (q.v.), but have the point of the *Canis*, and the fore-limbs are of the *Canis* type. The body is long, and the hind legs are well fitted for discharging their duties with its long drooping ears. The coat is of various shades of bloodhound pup. The face is black and tan, and brown.

Dacia was an ancient kingdom of the Getæ, situated between the Carpathians, which separated it from the S. the Danube, on the N. the Black Sea, on the W. the Theiss. It was a part of Bessarabia, and was more considerable than the Thracians, and the Getæ spoke the same language as the Dacians of Dacia. It was the home of slaves, of the Dacians. In 10 B.C., Augustus made a brave attack on it, and it was subdued a formidable power. It was the home of the climate. It was the home of the Dacians, and the Dacians withdrew from the boundary,

and abandoning Dacia to the Goths, who in their turn had to yield to the Huns.

Dacier, ANDRÉ (1657 or 1651-1722), a French philologist, who, born at Castres, studied at Saumur, and was there the pupil of Tanneguy-Lefèvre, with whose daughter Anne he shared the professor's tuition. After the death of Lefèvre he returned to Castres, and from there went to Paris, where he prepared an edition of *Festus* for the celebrated *Delphin* issue. In 1683 he married Anne Lefèvre, whose erudition caused the union to be spoken of as the "wedding of Greek and Latin." In 1685 they both joined the Catholic Church, and in 1695 the husband became a member of the Academy and keeper of the books at the Louvre. In 1713 he was appointed perpetual secretary of the Academy. Among his many works was an edition of Horace, with translation and criticism.

Dacoits (Hindu *dakait*), the name given to the gangs of robbers which infest the districts of Lower Bengal and other parts of India. *Dacoity*, or robbery by gangs, is prevalent in India and Burmah to a considerable extent.

Dacosta, ISAAC (1798-1860), a Dutch poet, born at Amsterdam, his father being a Portuguese Jew. He studied at Leyden, and in 1821 became a Christian. After the death of Bilderdijk he was the chief poet of Holland. In poetry his best known works were *Political Poems*, *Hesperides*, and *The Battle of Nicurpoort*, and he also wrote a treatise on *Israel and the Gentiles*.

Dacres, the name of a distinguished naval family, of which the most celebrated members are Vice-Admiral James Richard Dacres (1749-1810), Vice-Admiral Sir Richard Dacres (1761-1837), Vice-Admiral James Richard Dacres, junior, who died in 1854, and Admiral Sir Sidney Colpoys Dacres (1805-1884).

Dactyl, in classical metres, a foot consisting of one long followed by two short syllables (like *e.g.* the word "Gërmänŷ" in English), so called from a fancied resemblance to the joints of the finger (Gk. *daktulos*). Also, a similar arrangement of notes in music.

Dado (Spanish and Italian *dado*, a cube, a die, English *die*), in *Architecture*, properly the face of a pedestal between its base and its cornice. This part being sometimes coloured or otherwise ornamented, the name has been applied to the lower part of the surface of the inner walls of a room, when ornamented somewhat similarly and contrasting with the upper part. Thus, a margin or skirting, some three or four feet high, running round the walls and papered, painted, or panelled, or hung with some woven material, is now called a dado, a term rendered familiar by the "aesthetic movement" about 1880.

Dædalus (from the Greek *daídallein*, to work artistically) is the name of a half mythological half historical man who was the most ancient Greek sculptor, architect, and mechanic, and the father of Cretan art. He is supposed to have lived in the 13th century B.C., and to have been

contemporary with Theseus and Minos. Originally of Athens, he is said to have killed his nephew who was a rival artist, and to have been exiled and to have taken refuge in Crete, where he constructed the labyrinth for Minos. Shut in this labyrinth with his son Icarus, he made wings and the two escaped, but Icarus flew too near the sun and melted the wax which fastened his wings, and, falling, was drowned in the sea which afterwards bore his name. Some have explained this wing story by saying that Dædalus invented sails by means of which he outstripped Minos's rowing-boats. Dædalus is said to have reached Cumæ and to have gone to Sicily, where he built a fortress for the king. What Orpheus was to poetry, says one writer, and Linus to music, such was Dædalus to mechanics.

Daffodil. [NARCISSUS.]

Dafir (ZAFİR, ZEFİR), one of the great Bedouin tribes of Arabia, occupying all the north-eastern part of the peninsula between Nejd and the Lower Euphrates. They comprise six main branches: Beni Saïd, el-Areif, Ab'edra'a, el-Na'alim, el-Feluh, and el-Messamir, with a large number of subdivisions. Their domain is limited on the north-west by that of the Anezeh Bedouins, and on the north by the Montefiks of the Euphrates Valley.

Dafia (DOFLA, DUFLA), an uncivilised people of the Eastern Himalayas, north of Assam, near the north-east frontier of British India, between the Brahmaputra and the Chumleri Hills. The national name is Bangni (Banghin); that is, "Men," and they are related to their western neighbours, the Abors, both being offshoots of the Bod (Tibetan) race. They till a little land round about their scattered settlements, but their chief resource is hunting, especially since their predatory expeditions into the fertile plains of Assam have been suppressed by the Indian Government, which allows a subsidy of £240 to the chief headmen. They practise both polygamy and polyandry, and otherwise live in a very primitive state, with little social organisation—no religion, priests, or even medicine men.

Daghestan, a district of 11,400 square miles with 530,000 inhabitants, forming a Russian government in the Caucasian territory. The country, whose name signifies "mountainous" in Turkish, extends from the Upper Terek Valley to the Caspian, and is penetrated by three spurs of the Caucasus, one of which near the capital, Derbend, divides the land into North and South. Since its re-organisation in 1867 it comprises the Russian administrative divisions of Lesghistan, Tarku, and Derbend, with parts of the ancient kingdom of Georgia. It is a sort of Switzerland, with mountains, valleys, lakes, and torrents flowing into the Caspian. The land is fertile, and there is much rain. Among the products are wheat, tobacco, fruits, and abundance of wild vines which yield good grapes. Cattle are reared in the mountains, and the forests abound in game. The camel, horse, ass, mule, sheep and goat are reared. Among the minerals are lead, sulphur, and iron. Russian

authority has been acknowledged since the submission of Schamyl in 1859, but is not very firmly fixed.

Daghestani (that is, *Highlanders*), a term applied collectively to all the peoples of the Eastern Caucasus. The term *Lesghi*, the *Ligyes* of Herodotus, is often applied in a general way to these populations, of which the Lesghians proper form one of the chief branches. [LESGHIAN.] But these are quite distinct, at least in speech, both from the Andi, Dargo, Dido, Duodez, Ude, and Kubachi, who are usually grouped with them, and from the Chechenzes, who form another great division of the Daghestani peoples [CHECHENZES], and with whom are more or less closely connected the Ingush, Galgai, Karabulak, Kist, and Tush tribes. Total population of all the Daghestani aborigines, about 587,000. All observers comment on the extraordinary number of apparently fundamentally distinct languages still current among the aborigines, some common to large groups, such as the Avars, Lesghians, and Chechenzes, but others confined to quite small communities, such as the Udes, Kubachi, and Dido, occupying a few isolated villages in the more inaccessible parts of the Eastern Caucasus. [CAUCASIANS II.]

Dago, a Russian island in the government of Esthonia at the entry of the Gulf of Finland, and N. of the island of Oesel, from which it is separated by a narrow channel. It became Russian in 1791, and the inhabitants who are Danish, Swedish, and Russian, subsist chiefly by hunting and fishing—especially sealing. There is some coasting trade. Area 370 square miles.

Dagobert, the name of some of the Merovingian dynasty of Frankish kings, of whom, perhaps, the most notable was Dagobert I. (602–638), the son of Hlothar II. He won victories over the Bretons and Gascons, and founded the Abbey of St. Denis. His reign was the last flash of Merovingian brightness.

Dagon, the national god of the Philistines, or, as some think, the generic name of a set of beings such as the satyrs or Fauns of classical mythology. The cities Ashdod and Gaza were the headquarters of his worship, and he is generally supposed to have been represented as having the head and hands of a man with the lower parts of a fish. There is some doubt, however, upon etymological grounds whether he was a maritime god or the god of corn and fertility.

Daguerreotype, a photographic printing process which takes its name from that of its inventor—a Parisian scene-painter, Daguerre. The discovery was publicly announced in 1839, and Daguerre and his partner, Niepce, received life-pensions from the French Government. The process, though not of any present photographic value, is interesting as being the first practical method of fixing the image obtained by the camera, and on account of the impetus hence given to photography. It is carried out in the following manner:—A smooth copper plate is silvered, and the surface thoroughly cleaned and perfectly polished. It is then exposed in a small box to the vapours of—(1) iodine; (2) bromine,

by which operations a film of silver bromo-iodide is formed upon the plate. After being again submitted for a shorter time to the action of iodine vapour, it is ready for use in the camera. A few seconds' exposure suffices for the formation of the latent image, which must be afterwards developed by the action of mercury vapour, obtained by heating the metal to about 170° C. When developed, it is *fixed* by immersing in a solution of sodium hyposulphite, and, if desired, can be *toned* by means of gold chloride. The operations of sensitising and developing should, of course, be performed in yellow or ruby light.

Dahlgren, JOHN A., American naval officer, was born at Philadelphia in 1809, and at a comparatively early age turned his attention to the construction of heavy guns. In 1847 he became chief of the Ordnance Department at Washington, and while there invented the smooth-bore guns which bear his name. In 1863 he was given command, as rear-admiral, of the South Atlantic squadron, with which he organised the blockade of Charleston, and made several fierce attacks on the seaward defences of the town. These culminated in a gallant but unsuccessful assault on Fort Sumter. The admiral died in 1870.

Dahlia, a genus of herbaceous plants belonging to the order *Compositæ*, named after Dr. Dahl, a pupil of Linnaeus. *D. variabilis*, a native of Mexico, where it grows in sand at an altitude of 5,000 feet, was introduced into Europe in 1784 and again in 1804. It has fasciculate, spindle-shaped, tuberous roots, which were expected to prove edible but are acrid. The plant grows seven or eight feet high in rich loam, but becomes dwarfed in lighter soil. Its foliage is coarse, and the whole plant is glabrous. The head of flowers is surrounded by a double involucre, and has *radially* *receptaculum* and no pappus. When first introduced, the *disk* *yellow* *corolla* was flat, the disk yellow, the *corolla* *scarlet*, but under cultivation it has become an infinite number of forms. The *corolla* of these the head has *corollas* of all the florets *funnel-shaped*. [Dahlia *funnel-shaped* has of late returned to the *heads* with large ray-florets. The plants can be raised *in March*, or from cuttings *in March* from north and east *in March* varieties are in bloom from June to October.

Dahlgren (1785-1829), a Swedish naval officer, born at *Stockholm*, and at *Stockholm* city, and *Stockholm* city. His *specialty* was *naval* Professor at *Stockholm* Schleswig-*Denmark* by *Denmark* in Denmark. He *was* and in 1829 *was* a great *Liberal*. He *was* to Leipzig,

then to Jena, and in 1842 he became Professor of History at Bonn. In 1848 he again for a time came to the front in politics, but he soon went back to private life. Among his chief works are a *History of Denmark*, *The Sources of German History*, a *History of the English Revolution*, and a *History of the French Revolution*.

Dahomey, a French colony on the N. coast of the Gulf of Guinea, between Lagos and Togoland. It has a seaboard of 35 miles, and the coast region has many swamps and lagoons, of which the principal are named Avon and Dereham respectively. Inland it stretches 65 miles to the Kong mountains. Whydah is the chief port, and the capital is Abomey. The land is fertile, and produces plentifully palm oil, maize, beans, peas, tropical fruits, cotton, sugar, and spice. Sheep, goats, and poultry are sparingly bred, and there is some manufacture of cotton cloths, and of weapons and tools of native iron. The climate is fairly good, and the strong winds which often prevail keep the air purified. The greatest drawback to life in Dahomey is the prevalence of the "Guinea worm." During a great part of the year the coast is almost unapproachable owing to the breakers and surf which are known as the "Guinea Coast Bar." There is a little iron and copper in the country, but gold and silver are plentiful, and the natives display great taste in working them. Dahomey was once a great centre of the slave trade, but this profitable industry has now ceased. The former standing army included the famous Amazons, who probably did not number more than 2,000. The French hunter, Jules Gerard, was deceived on this point by their being marched over and over again in front of him after the fashion of a stage army. It was not till the 18th century that Dahomey came much into notice, and the first king of note was Ghezo, who in 1852 made a treaty with England for the abolition of the slave trade. He died in 1858. Gelele, a later king, received an English mission in the person of Captain (afterwards Sir Richard) Burton. In 1894, Dahomey was annexed by France, but the Kingdom formally existed till 1900, in which year the king, in consequence of his intrigues, was seized and afterwards exiled.

The Inhabitants. The Ffons (Ffon, Efon), as they were formerly called, appear to have originally migrated from the Upper Niger Basin to their present homes, where Taku-donu, founder of the royal dynasty, established himself at Ardra (Allada), and about 1625 built the palace of Dahomi (Dahwomi), from which his subjects gradually adopted the name of Dahomans, though their language is still called Ffon or Efon. This language, which is allied to the Ga and Tchi of the Gold Coast, is a chief member of the Ewe (Ehwe) group, of which the other branches are the Mahi (Makki) of the hill country in the interior; Anfuch, current in the districts of Anfuch, Trepe, Ehwe-anio, Agotine, and others along the left bank of the Volta; Awuna (Aulo) on the south-west coast; Whydea (Hweta) and Ehwemi on the south and south-east coasts towards Yorubuland, with total range of 150 miles along the seaboard, and

perhaps 200 miles inland. The Dahomans are typical negroes, somewhat more advanced in the social scale than their western neighbours, the Ashantis of the Gold Coast, but greatly inferior to the Yorubas on their eastern frontier. Amongst them the early closing of the cranial sutures is very marked, so that skulls of adults are often found without any visible transverse or longitudinal sutures. Hence, although quick and intelligent in their youth, they make little further advance after the age of puberty, when the mind is arrested while the physical nature acquires its full development, mastering and even deadening the mental qualities. They are impulsive without application, imitative without invention, indolent and energetic, though, like children, subject to sudden outbursts of passion, cruel and strangely insensible to physical suffering, as shown by the sanguinary rites and atrocities associated with the periodical "customs." These customs are said to have been instituted by Taku-donu's successor, Adahunzu (Adanzu), second king of Dahomey, who died about 1650. But the prevalence of similar practices amongst the Ashanti and other kindred peoples is sufficient proof that such horrors have formed part of the social and religious life of the Upper Guinea populations from the remotest times. (See Dalzel's *History of Dahomey*, 1793, and Major A. B. Ellis, *The Ewe-Speaking Peoples of the Slave Coast*, 1890.)

Daimios, the feudal nobles of Japan, originally chiefs subject to the Shōgun or commander-in-chief (popularly called Tycoon), whose government practically displaced that of the Mikado until the revolution in 1868. The country was parcelled out among them, and the Shōgun was their overlord. [JAPAN.]

Dairy (from a Norse word *dey*, a farm servant), a place where butter and cheese are made. The old-world dairy of poetry and art is being rapidly superseded by the co-operative "creamery," or cheese factory. [BUTTER, CHEESE, AGRICULTURE.]

Dairy Farming. [AGRICULTURE.]

Dais (Low Latin *discus*, a dining table), the name of the raised platform at the end of a college or castle hall, on which the lord and his immediate companions, or the head and fellows, sat to dine. In French the word has been again transferred to the canopy which sometimes was over this part of the hall, and thence to the canopy over a throne or altar.

Daisy (or else "the eye of the daie," as Chaucer calls it, the "bairnwort" of Yorkshire) is the favourite flower of children and of the poets of nature, from Chaucer to Burns. It is the "marguerite," or pearl, of the French. *Bellis perennis*, the common daisy, is the only British representative of its genus, one of the *Compositæ*. It is a perennial, growing throughout most of Europe as a weed in grass, with a short stem, a rosette of numerous, slightly hairy, spathulate leaves and scapes an inch or two high with yellow disk florets and white ray ones, pink at their tips and on their under-surfaces.

Garden varieties are often "double," or have all the florets crimson. That known as the "hen-and-chicken" daisy is interesting morphologically, as the ten or twelve bracts of the involucre have each an axillary branch bearing a small inflorescence. The daisy blossoms almost all the year round. The ox-eye, or moon, daisy is the common larger-flowered meadow weed, *Chrysanthemum leucanthemum*, and the name Michaelmas Daisy is given to autumn-flowering species of *Aster* (q.v.).

Dakota, since 1861 a territory of the United States of America, situate in lat. 42° 28' to 49° N., and long. 96° 25' to 104° 5' W., having on the N. Assiniboia and Manitoba, on the S. Nebraska, on the E. Minnesota and Iowa, and on the W. Montana and Wyoming; in 1889 the territory was formed into two states of nearly equal size, N. Dakota, with capital Bismarck, and S. Dakota, with capital Yankton. It consists mostly of plain, till lately prairie and covered by herds of bison, with a stretch of high plateau running from N.W. to S.E., and a smaller stretch to the E. of James river valley. The country seems once to have been the bed of a great lake, and consists largely of glacial and alluvial drift. The territory is well watered by the Missouri, which flows from N.W. to S.E. and receives many tributaries, and by the Red River which flows N. into Lake Winnipeg. In the S.W. is the district of the Black Hills, which covers 3,000 square miles and rises to a height of 8,200 feet. The country produces good varieties of stone, clays, chalk, and gypsum, and part of it is underlain by beds of lignite. There are springs of natural gas. Among metals, gold is largely worked, as is silver to a smaller extent, and more tin is produced by Dakota than by any other part of America. The climate much resembles that of the neighbouring parts of Canada—warm summers with cool nights, and cold but bright and exhilarating winters. Blizzards and cyclones are not infrequent. The land, by reason of its freedom from timber, is specially fitted for farming and grazing. The rapid strides made by civilisation in these days is shown by the fact that in 1851 a first treaty was made with the Indians for part of their hunting grounds; and now the bison has gone, and the Red Indian is fast disappearing.

Dakotas, one of the stock races of the American aborigines, called also Sioux [SIOUAN], formerly widespread throughout the Mississippi basin (North and South Dakota are named from them, parts of Minnesota, Wisconsin, Iowa, Nebraska, Kansas, Missouri, Arkansas, Indian Territory), with outlying branches in Manitoba (Assiniboins), and isolated colonies in Alabama (Biloxi), the borders of Virginia and North Carolina (Tutelo), and, according to some authorities, in both Carolinas (Catawba). Being essentially a hunting people, the Dakotas were at no time very numerous, though necessarily spread over a wide range; in 1903 they were computed to be reduced to less than 45,000, of whom 19,000 were in the South Dakota reserves, 7,000 in North Dakota, the rest in Nebraska, Minnesota, Wisconsin, and Canada. The Dakotas, i.e. "Leagued"

or "Allied," when first known to the whites, were constituted in a confederacy of seven nations forming the "Seven Great Council Fires," of which the more important surviving bands are the *Yanktons* and *Yanktonais*, i.e. "at the end," in reference to the remote position of their villages; *Sihhasapa*, or Blackfeet, different from the Canadian Blackfeet, who are Algonquians; *Ohehoupa*, or Two Kettles; *Itaziptco*, the Sans Arc, or "Bowless," of the Franco-Canadians; *Minnecongje*, "Planters by the Water"; *Sitconju*, i.e. Brulés, or "Burnt Hips"; *Santee*, properly *Isanti*, i.e. "Knife People," so called from the material found in their territory from which stone knives were made, included the *Wahpeton*, or "Forest Men," and the *Sisseton*, or "Prairie Marsh Men"; *Ogalala* (*Oglala*), of unknown meaning; *Unkpapa*, most warlike and most powerful of all the "Allied." Frequent mention is also made of a "Teton" tribe; but this appears to be merely a collective name for all the prairie bands as opposed to those of the woodlands, from a root *tintan*, "treeless land." Since the rupture of the league and the restriction of all the bands to the various reserves, many, and especially the Yanktons, have adapted themselves to a settled life, and even made considerable progress in agriculture. But all have suffered much from the fraudulent dealings of the Government agents, and in 1891 were reduced to such distress that they were with difficulty prevented from leaving the reserves and joining in a general revolt. Physically and mentally, the Dakotas can scarcely be distinguished from the Red Skins; but their speech, which presents some remarkable peculiarities, differs radically from all others, forming one of the most widely diffused stock languages of the American continent. The phonetic system is marked by strong aspiration, extensive nasalisation, the absence of true diphthongs and of *h* letters; there is no grammatical gender; the nouns are distinguished by sex; the nouns of the third declension have two or three locative endings; the verbs have two degrees of comparison; the pronouns are *ni*, common both to nouns and persons, and *ni*, extremely limited use, *ni* to men, as if the number of persons were of no notice. (See *Annual Report of the Bureau of Ethnology for 1882-83*, Washington, 1883; *Wash. Ethnol.*, 1882-83, Washington, 1883; *Dakota*; D. S. C. *Journal of the Sioux*, etc., New York, 1883; *Bibliography of the Sioux*, etc., Washington, 1883.)

Dalberg, a noble German nobleman of historical importance, was a chamberlain of the Emperor Frederick II. in 1002. He was the 12th in the line of the name to the branch. Among the most prominent (1744-1817), he was chancellor of the confederation of the German states of Frankfurt.

Dale, ROBERT WILLIAM (b. 1829, d. 1895), an independent minister of Birmingham, was well known as taking a prominent part in local politics. He was born in London, and graduated as M.A. of London University in 1853. In the same year he joined the ministry, and was appointed to the Carr's Lane Congregational chapel in Birmingham, where he was the colleague of John Angell James, whom he succeeded in the chief pastorate. In 1868-9 he was chairman of the Congregational Union of England and Wales, and for seven years he edited the *Congregationalist*. Among his numerous writings were articles in reviews and magazines, and he also edited a translation of Reuss on the *Theology of the Apostolic Age*. In 1877 he lectured upon preaching at Yale College, Connecticut, U.S.A., and received from that body the degree of D.D., becoming also LL.D. of Glasgow in 1883. He was for a time vice-chairman of the Birmingham school board, and in 1886 he was a member of the Royal Commission upon the Elementary Education Acts. He was a governor of Birmingham grammar school.

D'Alembert, JEAN (1717-1783)—called "Le Rond," from the circumstance of his being abandoned when an infant upon the steps of the church of St. Jean-le-Rond—a French writer and mathematician, born in Paris. His father, who abandoned him, provided for his education, and he was put under the care of a foster-mother, for whom he always maintained a great affection. From 12 to 17 he was educated at the "Collège Mazarin," and, after reading law, he was admitted advocate in 1738. But his bent was to geometry. In 1739-40 he contributed papers to the Academy of Science, of which he became a member in 1741. In 1744 he wrote upon the *Equilibrium and Movement of Fluids*, in 1746 upon the *General Cause of Winds*, thereby gaining a medal from the Academy of Berlin, in 1749 upon the *Precession of the Equinoxes*, and in 1752 upon the *Resistances of Fluids*. From 1751 to 1772 he was associated with Diderot in producing the *Encyclopædia*, for which he wrote a memorable preface (a table of human knowledge), and conducted generally the mathematical and physical as well as some of the literary and philosophical articles. In 1759 he published *Elements of Philosophy*. He was a sceptic in philosophy, but his views were marked by much discretion. In 1772 he became perpetual secretary of the Academy. He was a friend of Voltaire, and a voluminous correspondence commemorates this friendship. Both Frederick of Prussia and Catherine of Russia made overtures to him, but he was not ambitious of distinction.

D'Alembert's Principle, in dynamics of systems of particles, is that the external forces on any system are equivalent to the mass-accelerations produced, the internal forces of the system being in that connection negligible. It is, in fact, a statement that the observed external causes are equivalent, as a whole, to the observed effects produced. By its use generalised methods for solution of innumerable problems are obtained. [DYNAMICS.]

Dalhousie, JAMES ANDREW BROWN RAMSAY,

MARQUIS OF (1812-1860), a noted Governor-General of India. The son of the Earl of Dalhousie, he was educated at Harrow and Christ Church, and, having become by courtesy Lord Ramsay in 1832 owing to the death of his elder brother, he entered Parliament as member for Haddingtonshire in 1837. In 1838 his father's death advanced him to the House of Peers. In 1843 he was Vice-President of the Board of Trade in Sir Robert Peel's government, and in 1845 President. In 1846 Lord John Russell succeeded to the government, and asked him to stay on in office. In 1847 he was Governor-General of India. In this office he displayed great power in acquiring territory and in developing the resources of the empire. Under his auspices Pegu and the Punjab were conquered, and Oudh with many other states annexed. He did much for trade, agriculture, forestry, and mining, encouraged railways, telegraphs, roads, and canals, reorganised the postal service, established irrigation works, formed a Legislative Council, and introduced the principle of competition in the Civil Service. He also tried to put down suttee, infanticide, and thuggee. One of his greatest works was the cutting of the Ganges Canal. In 1856 the state of his health forced him to resign. He had already in 1849 received the thanks of Parliament and of the East India Company, and been created Marquis, and in 1852 made Lord Warden of the Cinque Ports. He took no further part in public life, and as he left no male issue the marquissate died with him. It is a question sometimes raised whether his vigorous policy was not one of the causes of the Sepoy mutiny and general revolt.

Dalkeith, a Scottish town upon a spit of land caused by the confluence of the N. and S. Esk to form the Esk, 6 miles S.E. of Edinburgh, in the county of Mid-Lothian. It is a great centre of the Scottish corn trade, and has mills, foundries, breweries, and tanneries. At the old church Dr. Norman Macleod was pastor for three years. Here is also the palace of the Duke of Buccleuch, where used to reside the Regent Morton, who sold the palace to the then Duke of Buccleuch. Charles Edward spent two days here after the battle of Preston Pans, and George IV. and Queen Victoria have each visited it. The present palace was built in 1700 for the widow of the Duke of Monmouth. (Population 1901, 6,812)

Dallas, the capital of Dallas county, Texas, U.S., on the left bank of Trinity river, 265 miles N.W. of Houston. It has colleges, flour-mills, foundries, and the like, and there are manufactures of woollen goods and soap among other things.

Dalmanella, a genus of Trilobites belonging to the family *Phacopidae*, found in the Silurian and Devonian systems. The best known English species is *Dalmanella longicaudata*, from the Upper Silurian. The genus differs from *Phacops*—the type of the family—by its pointed "free cheeks" (the hinder outer angles of the head) and the sharp tail-like spine on the "pygidium," the hindmost division of the body.

Dalmatia, an Austrian territory lying along

the Adriatic Sea, and having on the N. Croatia, on the S. Montenegro and the sea, on the E. Bosnia and Herzegovina, and on the W. the sea. It has an area of 4,940 square miles. The coast is everywhere steep and rocky, and is studded with numerous picturesque islands and bays. Inland are mountains and moors, with streams and lakes which dry up in the summer. Parallel chains from the spurs of the Julian and Dinaric Alps traverse the country, and rise to a height of 6,000 feet. Half the land is in pasture, and there is some good ship timber. Wine, oil, brandy, hides, wool, wax, honey and fruit are among the products of the district. The climate is uncertain, with an average temperature of 60° and a rainfall of 28 ins. The inhabitants are good sailors and fishermen, but do not care much for agricultural pursuits. The Dalmatians were subdued by Augustus, and then fell successively into the hands of the Goths, Avars, and Slavs. In the 11th century the country was partly Hungarian and partly under Venetian protection. After other vicissitudes it finally was assigned to Austria in 1814. The present inhabitants of Dalmatia are almost exclusively Slavs of the Serbo-Croatian branch, who occupied this region about the year 620, after expelling and partly absorbing the Avars, themselves intruders since the close of the fifth century. These had been preceded by the Goths (Moeso-Goths), who had occupied the country after the fall of the Western Empire, reducing and apparently imposing their language on the original Illyrian populations. The Slavs retained their political independence till the beginning of the eleventh century, when Dalmatia was dismembered, one section being conquered by Ladislaus, King of Hungary, while the rest accepted the protection of Venice against the Turks. In consequence of these historical vicissitudes the peoples of the coastlands (Venetian Dalmatia) have been gradually Italianised, and Italian is now universally current along the seaboard from Istria to Montenegro. But the Morlaks, as the inhabitants of Upper Dalmatia are called, still retain their Servian speech, and are regarded as pure Slavs, though really a mixture of Slavs, Goths, Avars, and Albanians (Illyrians). The Morlak peasantry are amongst the rudest peoples of Europe, though physically a fine race, tall and shapely, betraying their diverse descent in the occurrence of blue eyes and fair complexion in association with dark or olive skins and chestnut hair. Of the present population (593,784 in 1900), about 430,000 are Roman Catholics of the Latin rite, all the rest Orthodox Greek, except a few hundred United Greeks and Jews. (See Ch. Yriarte, *L'Istrie et la Dalmatie in Tour du Monde*, xxix., 1874; A. Schmidt, *Das Königreich Dalmatien*, Stuttgart, 1842; J. Gardner Wilkinson, *Dalmatia and Montenegro*, London, 1848; A. Paton, *Highlands and Islands of the Adriatic*, London, 1849.)

Dalmatian Dog. [CARRIAGE DOG.]

Dalmatic, an ecclesiastical vestment somewhat like a surplice, but more richly embroidered, longer, and with round instead of pointed sleeves.

It seems to have been first worn in Dalmatia, whence the name, and is mentioned as existing as early as A.D. 250. It was sometimes worn by mediæval kings at their coronation, and Edward I. was buried in one of red silk. In the Anglican ritual it is the special vestment of the assistant ministers in the Holy Communion.

Dalriada, the name of an old Irish territory now forming the northern part of the county of Antrim. It was inhabited by a colony of Gaelic Scots who dwelt among the Picts. In 498 some of them migrated to Argyll, and founded another Dalriada. In 843 MacAlpin united Scots and Picts, and founded the kingdom of Albion or Scotland.

Dalrymple, ALEXANDER (1737-1808), was born near Edinburgh. At the age of sixteen he entered the East India Company's service, and getting on in it he was in 1759 employed to explore the Eastern Archipelago, and in 1764 to open up trade with China. In 1775 he was in the Council of Madras, and in 1779 he was appointed hydrographer to the Company, and from 1795-1808 to a similar post under the Admiralty. He appears to have been at the least eccentric, and having an idea that there existed an Antarctic continent, he proposed to the Government an exploration on condition that he should have for a term of years possession of the lands that he might discover. He produced some good maps, and interesting works.

Dalton, JOHN (1766-1844), physicist and chemist, was born at Manchester of a Quaker family. Educated in Manchester till fifteen years old, he was then sent to Kendal to a school kept by a relative. In 1788 he began his observations in meteorology, besides turning his attention to botany and other scientific subjects. In 1793 he was appointed Professor of Mathematics and Physics at Manchester. In 1794 he made researches into the nature of colour blindness, from which he published the following years he supported himself by tuition and lecturing. He was elected a member of the Royal Society, and associated with it. In 1833 he received a pension of £500. He was elected a member of the Royal Society, and associated with it. In 1833 he received a pension of £500. He was elected a member of the Royal Society, and associated with it. In 1833 he received a pension of £500.

He was born at Lancashire 16 years of age, and a New System of Chemistry (1810). As a physicist he was distinguished by his researches into the properties of the spectrum, and his elaborate system of chemical notation, and

He was born at Binns, a general of infantry, and was forced to

leave the country during the Commonwealth, and took service with the Russians against the Tartars and Turks. In 1666 he was commander-in-chief in Scotland, and distinguished himself by his cruelty to the Covenanters, introducing methods of dealing which he had learned in foreign service, like Colonel Kirke a few years later.

Dam, in *Civil Engineering*, is a structure erected to prevent the flow of water from one level to another, or to regulate this flow. Cofferdams (q.v.) are treated separately, and this article confines itself to the important class of structures known as masonry-dams and earth embankments. In the formation of a reservoir for the storage of water a spot is frequently chosen where the disposition of the ground is such that by building a masonry or earthen embankment of comparatively short length a large basin may be enclosed for the reception of water. Earthen embankments are much employed in India, where they are made of clay soil well watered and trampled down. The water side is built at a much steeper angle than the outer face, and is generally protected by a bed of puddle or small stone. The danger is lest the water should leak through the embankment, undermine its foundations, and carry it away. Masonry dams can only be constructed on rock foundations, but are much to be preferred. They may be built to great heights, the Furens dam in America being 200 feet high, and the Vyrnwy dam, the retaining wall of which consists of cyclopean stones 100 feet above ground, with 60 feet of foundation. The slopes on each side are steeper than in the case of earthworks, steeper on the water side than on the outer face. The shape of section is carefully designed, so that every layer of stone is of sufficient dimensions to withstand the weight of masonry above it and the possible pressure of water on that masonry; the resultant pressure on any such layer should pass through its middle third both when the reservoir is empty and when full. The overflow from the reservoir is carried off over a waste-weir. It is of much importance that the waste-weir should be adequate at all times.

Damage feasant is where a stranger's beasts are found on another person's land without leave or licence. A man is answerable not only for his own trespass, but for that of his cattle also; for if by his negligent keeping they stray upon the land of another (and much more if he permits or drives them on), and they there tread down his neighbour's hedge, or spoil his corn or his trees, this is a trespass for which the owner must answer in damages. And the law gives the party injured a double remedy in this case by permitting him to distrain the cattle, thus *damage feasant*, or doing damage, till the owner shall make him satisfaction, or else by leaving him to his remedy by action.

Damages, a sum of money awarded to be paid by one person to another as compensation for loss sustained by the latter in consequence of an injury or injuries committed or suffered by the former. The test by which the amount is arrived at is known as the measure of damages. Thus, where a

vendor sues his purchaser for breach of contract for the sale of goods, the measure of such damages should be the price of the goods if the property in them has passed to the purchaser, or the difference between the contract price and the market price at the time of the breach if the vendor has re-sold the goods. *Liquidated* damages are a sum agreed on between the parties, to be paid in case of a breach occurring, in order to save the costs and trouble of ascertaining the damage actually sustained. *Nominal* damages (such as a farthing) show that in the opinion of the court no real damage has been sustained, though a right may have been established. *Exemplary* damages consist not only of pecuniary compensation, but as a sort of punishment of the defendant with the view of preventing similar wrongs in future. *Consequential* damages are those losses or injuries which follow an act, but are not direct and immediate upon it. Courts of Equity have long laboured under the disadvantage of not being able to award damages for fraud or non-performance of contract. This was remedied by "Lord Cairns' Act," passed in the reign of Victoria, which gave jurisdiction to the court to award damages in addition to the equitable relief sought, and though that Act has been itself since repealed, it was in substance re-enacted by the Judicature Act, 1873. The "General Riot Damages Act," 1886, provides compensation out of the police rate to any person sustaining damage by riot. A serious riot which occurred in London in February, 1886, after a Socialist meeting in Trafalgar Square, led first of all to provision for this state of things, applicable to the metropolis only. This was quickly followed by the above Act. In former times compensation was recoverable from the "hundredors," from whom the liability has now been transferred as above. [HUNDRED.]

Daman. [HYRAX.]

Daman, a coast territory of Portuguese India in the province of Gujerat, and about 100 miles N. of Bombay. It contains 82 square miles, and has a population of 49,000. The country is fertile, and the teak forests produce abundance of timber well fitted for ship-building, and the climate is healthy, but in the wet season the country is inundated. It is watered by the Daman-Ganga, which rises in the Western Ghauts, and the port at the mouth of this river is rendered well-nigh inaccessible by a bar. Once the district had prosperous weaving and dyeing works, and did much trade in opium, but the introduction of Manchester goods has displaced the former of these industries, and the policy of the Government has destroyed the third. Now the principal pursuit is deep-sea fishing.

Daman-i-Koh, a hilly native conservation in Bengal, extending over 1,366 square miles, and having a population of 353,413.

Damaraland, a district of varied desert, mountain, and pasture-land of South Africa, bordering upon Namaqualand and stretching from the Atlantic to long. 19° 45' E. The coast, which is waterless, is now part of the German protectorate, and on it is Walfisch Bay, which was

annexed by Cape Colony in 1884. The pasture land, which extends to the mountains, whose greatest height is 8,500 feet, is fertilised by a good rainfall. The district produces feathers, ivory, and skins. A rebellion broke out in 1903 among the natives, and the Germans experienced considerable difficulty in restoring order.

Damaras (properly DAMAQUA), the inhabitants of Damara or Herero Land, south-west coast of Africa, which for ages has been a debatable region between the Bantu and Hottentot races, the former advancing from the north (Obampoland), the latter slowly retreating southwards on the low-lying coastlands, and holding their ground in the uplands of the interior. Hence the twofold division of the present population into "Hill Damaras" of the Kaoko highlands, who are of Hottentot speech but of mixed Hottentot-Bantu descent, and "Cattle Damaras" or "Damaras of the Plains," who are pure Bantus, and whose proper name is Ova-Herero, the Merry People. These reached their present homes about 200 years ago from the region beyond the Cunene river, passing southwards between Obampoland on the coast to the Kaoko Hills, and here ramifying into two branches—the Ova-Mbandem, who went eastwards in the direction of Lake Ngami, and the Ova-Herero proper, who penetrated southwards nearly to Walfisch Bay. Here they came into collision with the Hau-Khoin, or "True Hottentots" of the hills, and the warfare thus begun between the two races has been carried on almost incessantly ever since. The Ova-Herero, physically a finer people even than the kindred Ova-Mpo, are essentially a pastoral nation divided into numerous tribes or castes (*ecanda*), whose headmen acknowledge the authority of the paramount chief of Damaraland. They have long been in close contact with the whites, and many have been evangelised, especially by German and Finnish missionaries, though they still practise certain pagan rites connected with nature-worship. Like their cattle they show a strange dislike of salt. (Chief Ova-Herero tribes: Kamaherero, Therawa, Kaoingava, Kambazembi, Kamwati, Kandjii, Onugunda, Ova-Mbanderu, Kukuri, Ova-Tyimba, with total population estimated at 200,000.)

Damascening is a term given to the process of producing a variegated appearance on the surface of steel by combining it irregularly with iron and by subsequent treatment of the surface with acid. The word is also used to denote the Indian Kufi-work, in which gold and silver wire is inlaid in the surface of the metal.

Damascus, the capital of Syria, is one of the most interesting cities of the world, both by reason of its antiquity and the part it has played in sacred history and for its pleasant situation and surroundings, which present a striking contrast to the rugged barrenness of the neighbouring districts. It is situated in a plain of 200 square miles, studded with towns and villages, having the chain of Anti-Libanus on the N.W., the Black Mountains on the S., and extensive marshes on the

E. The city is on the W. side of the plain, at an elevation of 2,260 feet, and near to a spur of Anti-Libanus, which rises to 3,840 feet. The river Abana or Barada—well known in connection with Naaman the Syrian—supplies the city with abundance of the purest water, which is distributed by a great network of canals. An area of 60 miles is covered with orchards, gardens, vineyards and fields. The old walled city lies to the S. of the river, and the "street which is called Straight" still separates the Jewish quarter on the S. from the Christian quarter on the N. On the W. is the 13th century citadel, and the 8th century mosque occupies the site of an ancient Christian church which usurped the place of a still older temple. Traces of the former are still to be found in the architecture and materials of the mosque. Damascus is still an emporium of overland trade, and its busy bazaars form an important and interesting feature. The mosque contains the reputed shrine of St. John the Baptist, and some valuable MSS. which are highly treasured, and one of its lofty minarets is called the "Jesus" minaret, and is said by tradition to be the point where Christ will appear to judge the world. The remains of ancient barbaric civilisation are everywhere to be seen side by side with the tokens of modern civilised barbarism. The population of 150,000 is mostly Mohammedan. The ancient city was devastated by Tamerlane, and at a later period by the Turks, becoming Mohammedan in 634. Until 1832 the Jews and the Christians were subject to many disabilities, and the great massacre of 1860 did much to undo the work of the most industrious part of the population. There is still some manufacture of silks and woollens, but the old industry of cutlery for which Damascus was famed seems to have died out. Sir Richard Burton delighted in Damascus, and his fame still survives there.

Damasus was pope thirty-ninth Arians, and combatants his reign. The translation of and he did in the Catacombs, check the anticipating evidence of great need other litera-

became in 366 the cardinal of the slaughter of the beginning of to make the Vulgate, and beautifying the works was to the clergy, thus again, and the Letters, and an ecclesiastic being a swine- and Bishop of the father of Hilde- he was em- Among his known as Father his minis- and wretched the island of court almost

certain death in the alleviation of their horrible sufferings. Entering on his mission in 1873, for twelve years he laboured faithfully among his flock, performing the most menial offices till stricken down in 1885. During the latter years of his ministration he received the assistance of another priest in his truly Christian work.

Damiens, ROBERT FRANCOIS, born near Arras in Artois, in France, in 1714, was forced to fly from Paris on charges of robbery and poisoning, and on his return found a quarrel in active progress between the Church and Parliament, in which the king was implicated. The motive of his crime, attributed by some to the Jesuits, by others to insanity, is uncertain, but as Louis XV., surrounded by his body-guard, was entering his carriage, he was stabbed by Damiens. The wretched man, after being horribly tortured, was torn to pieces by horses, and his family banished the country, 1757.

Damietta, a town and river-port of Lower Egypt, on the right bank of the eastern branch of the Nile, about 8 miles above its junction with the sea. The want of a good harbour and the commercial growth of Alexandria have impaired its prosperity, especially in its trade relations with European countries. Its exports consist chiefly of grain, fish, rice, coffee, dates, hides, and tallow. It is 113 miles N. by E. from Cairo by rail, and, though destitute of any remains of antiquity, contains several handsome buildings, including mosques, khans, cafés, and kiosks. The climate is considered salubrious.

Dammar, a series of copalline resins, hard, transparent, brittle, straw-coloured, and odourless when solid, soluble in ether, benzol, or chloroform. Much of that in commerce is the produce of *Dammara orientalis*, the Amboyna pine, a native of Java and the Moluccas, reaching 100 feet in height, and comes to us from Batavia and through Singapore, whence Britain imports 1,000 tons annually. *D. australis*, the Cowdie or Kauri pine of New Zealand, 150 to 200 feet high, yields a similar resin known as Kauri gum, worth £6 to £10 per cwt., as also do *D. orata*, *D. Cookii*, *D. lanceolata*, of New Caledonia, *D. robusta*, of Queensland, and *D. vitiensis*, of Fiji. In New Zealand this resin is also found fossil. In India several similar resins, little known in western commerce, are known as dammar. They are used as incense; but with us are valued for varnish-making. White dammar, or Piney varnish, is the produce of *Vateria indica* and *V. acuminata*; black dammar, of *Canarium strictum*; Sal dammar, of *Shorea robusta*; and Rock dammar, of *Hopea micrantha*.

Damocles, a courtier, companion, and parasite of the elder Dionysius, tyrant of Syracuse, who, having grossly flattered the monarch on one occasion, found at a magnificent banquet subsequently given in his honour a sword suspended above him by a single hair. The tyrant thus reminded him that "uneasy lies the head that wears a crown."

Damodar, or DAMMOODAH, a river of India, whose valleys abound in iron and coal, rises in the district of Lohardaga, presidency of Bengal, and,

after a southerly course of 350 miles, empties itself into the Hooghly. It has numerous tributaries, and is navigable for a considerable distance for large vessels.

Damoh, or DUMOH, a hilly district of the Jabalpur division, Central Provinces, British India, area 2,799 square miles. Its capital of the same name lies 50 miles E. of Sagar. The district, which is on the Vindhya plateau, abounds in jungle.

Damon, a Pythagorean, and friend of Pythias or Phintias, who was condemned to death for plotting against Dionysius I. of Syracuse, but was granted time to settle his private affairs, on condition that Pythias would go bail with his life for the re-appearance of his friend. Damon returned just in time, and the tyrant, struck with astonishment at his devotion, spared his life.

Damper is a hinged valve in a chimney or flue to vary the draught that can pass through. It also means the arrangement to stop the vibration of the wire of a piano after the notes have been struck and the fingers removed.

Dampier, a county on the S.E. coast of New South Wales; capital, Uluruya.

Dampier, WILLIAM, English navigator and buccaneer, was born in 1652. While on a voyage in 1699-1701 to New Holland, he discovered the Archipelago of New Britain, the Dampier Archipelago, and Dampier Strait. He made other voyages in 1705 and 1708-11. In 1698 he had been given a commission as commander in the navy. He wrote *A Voyage round the World*. He is supposed to have died in 1715.

Dampier Archipelago comprises numerous small islands off the N.W. coast of Australia, extending between long. 116° and 118° W. The largest of this rocky group.

Dampier's Land, a fertile peninsula on the north of Western Australia.

Dampier Strait. 1. Through this passage, having New Britain on the right and the S.W. coast of New Guinea on the left, lies the shortest route from Eastern Australia to China. 2. A channel, 70 miles long, in the North Pacific, between the island of Waygiou and the N.W. extremity of New Guinea.

Damping, in practical physics, is the diminution in the amplitude of the oscillations of a body by friction of some kind. In many electrical instruments it is necessary that the damping effect on the recording needle shall be vigorous and rapid; the needle quickly takes up its position of equilibrium and is said to be *dead-beat*. In other instruments we want the friction to be very slight and the decrement in amplitude to be small. In such cases the causes are removed that have a damping effect.

Damson, named from Damascus, whence it may have been originally introduced into Europe, is a variety of plum (*Prunus domestica*) with a small, oval, austere fruit, now often growing in a half-wild state. The fruit is made into tarts and into a preserve known as damson cheese. A yellow-fruited variety of the bullace (q.v.) is sold as "white damsons."

Dana, CHARLES ANDERSON, an American journalist, was born at Hinsdale, New Hampshire, in 1819, and graduated at Harvard. Becoming subsequently the manager of the *New York Tribune*, he strongly discountenanced in its pages the introduction of slavery into newly-acquired territories. In 1867 he edited the *New York Sun*, a democratic organ. From 1857 to 1863, in conjunction with a friend, he was engaged in organising and editing the *New American Encyclopædia*. Several translations were also published by him. He died in 1897.

Dana, JAMES DWIGHT, American naturalist, was born in Utica, New York State, in 1813, and after studying at Yale College, served, in 1838, on Wilkes' expedition of scientific exploration, a full account of which was subsequently published by him. In recognition of his services, in 1846, he was elected to the chair of natural history and geology in Yale College. His best known works are *Hawaiian Volcanoes*, *a System of Mineralogy*, and *a Text-Book of Geology*. He died in 1895.

Dana, RICHARD HENRY, poet, may be regarded as the father of American literature. Born at Cambridge, Massachusetts, in 1787, and educated at Harvard, he was called to the bar in 1811, but, abandoning law as a profession, in 1814, in conjunction with his friend Bryant, edited the *North American Review*, and in 1821, with Bryant and Allston, was joint proprietor of the *Idle Man*. In 1827 appeared his volume of poems, entitled the *Buccaneer and other Poems*, and in 1833 his *Collection of Prose and Verse*. He obtained considerable popularity as a lecturer, but, though a sound critic, his poetry does not reach a high standard. He died in 1879.

Dana, RICHARD HENRY, junr., son of Richard Henry Dana, the poet, was born in 1815 at Cambridge, Massachusetts, and made himself a reputation as lawyer and journalist, but more particularly as a novelist. In 1832, with the object of curing a weakness of his eyes, he was sent to sea in a sailing vessel that went from Boston to California. To this circumstance the world owes that delightful sea story *Two Years Before the Mast*, which first appeared in 1840. Mr. Dana also wrote *The Seaman's Friend* (1841), and *To Cuba and Back* (1859), as well as many legal works. He lived during his last years in Europe, and died at Rome in 1882.

Danaë, daughter of Acrisius, king of Argos, grandson of Danaus, was imprisoned by her father owing to an oracular response that she would be the mother of a child, the slayer of his grandfather. Visited by Zeus in prison amid a shower of gold, she eventually gave birth to a son, Perseus. Mother and son were thrown into the sea in a chest by Acrisius, and drifted to the island of Seriphos. Arrived at manhood, Perseus accompanied his mother to Argos, and subsequently, as foretold, Acrisius, through an accident, met with his death at the hands of his grandson at Larissa.

Danaus, ruler of Libya, son of Belus, and brother of Ægyptus, ruler of Arabia, suspecting that his brother had designs on his life, fled with his fifty daughters to Argos, where he was elected

king. He was soon followed by the fifty sons of *Ægyptus* as suitors for the hand of his daughters. Their offer was accepted, but on the marriage night, by order of Danaus, they were all slain by their brides, excepting the husband of *Hypermnestra*.

Danbury, a semi-capital of Fairfield county, Connecticut, U.S., about 30 miles W.N.W. of New Haven. The soil is generally fertile, and, besides several important public buildings, the town contains numerous hat manufactories and a sewing-machine factory.

Danby, FRANCIS, A.R.A., a landscape painter, was born near Wexford, Ireland, in 1793, and, after pursuing his calling in Dublin, came to England in 1813, where he made a speciality of paintings lit up with the glow of sunset. His first work of pretension was his *Upas Tree of Java*, and at a later date his *Sunset at Sea after a Storm*, *Morning at Rhodes*, *Delivery of Israel out of Egypt*, and *Embarkation of Cleopatra on the Cydnus* gained him considerable notoriety. His death occurred at Exmouth, Devon, in 1861.

Dance, SIR NATHANIEL, a distinguished seaman in the service of the East India Company, was born in London in 1748, and was grandson of George Dance, the City architect. He went to sea in 1759, and in 1804, being then commodore, he left Canton with a large fleet for Europe. On Feb. 15 he was attacked by Admiral Linois, with five ships of war; but after a smart action he drove off the immensely superior force of the enemy in a manner which earned him the honour of knighthood from the king, and from the Court of Directors 2,000 guineas and a piece of plate.

Dance of Death, or DANSE MACABRE, a sort of allegorical ballet representing Death's dealings with mankind. It is frequently represented in the sacred art of the Middle Ages, and the sacred dances customary in the Middle Ages, as to other Pagan observances, which best to give a Christian interpretation. The dances of the kind seem to be a relic of the kind dances in the 11th century, and the authority to have taken place in the 15th. At any rate the dances were represented in a series of pictures on the walls of churches, monasteries, and in Germany and Switzerland. The pictures are accompanied by moral verses, which differ in the different countries. Some of the pictures are by a Bohemian poet, and the name is given to St. Macarius, who lived as a hermit. The Dance of Death in Basel, 1523, is a good example. The Dance of Death in the 15th century. But the Dance of Death is a very old and admirable picture from internal evidence, published as a book at the end of the 15th century. I think them the

work of a certain Hans Lutzenberger. They represent, however, not so much scenes in a dance as groups of various characters, among whom "the skeletonised Death, with all the animation of a living person, forms the most important personage—sometimes amusingly ludicrous, occasionally mischievous, but always busy and characteristically occupied." (Douce, *Dance of Death*, p. 82.)

Dancing, a natural expression of various emotions, found even among some species of birds. In mankind this natural movement early became specialised into expression of particular emotions, and accompanied with mimicry. Many savages work up their courage for battle by elaborate dancing and imitation of fighting. From an expression of feeling it naturally passes into one of desire, and then into a supposed means of attaining the end desired. Thus, when buffaloes were scarce, the Mandan Indians, who hunted them, "danced buffalo," i.e. dressed up as buffaloes and danced, pretending at times to fall as if shot, while others came forward and skinned them. In 1890-91 "ghost dancing," founded on misunderstood scraps of Christian teaching as to the Day of Judgment, was resorted to by the North American Indians to hasten the "restitution of all things," and nearly caused a general Indian revolt. "On the lower levels of culture," says Mr. Tylor, "men dance to express their feelings and wishes." Thus, dancing is commonly an act of worship, as in ancient Greece and Egypt and in the case of the Salii at Rome. Even King David danced before the Ark, and wherever under Christianity the control of emotion in worship has been much weakened, dancing has reappeared, as in the "dancing mania" of the Middle Ages, and with the Shakers of America. In Seville cathedral there is a periodical dance of choristers before the high altar, probably a survival of paganism. Greek and Roman civilisation tended to suppress the emotions, and non-religious dancing was left to professionals usually slave girls. "Hardly any one dances when sober," says Cicero, "unless he is mad." In the later Middle Ages stately and formal dances, doubtless adopted from rustic survivals of the religious dances of pre-Christian Europe, were in vogue among high society, and continued so until the early part of the 19th century. Chiefly owing to the contact of French officers with German and Russian society during Napoleon's wars, they were gradually expelled by the more rapid and exciting dances, of which the waltz is the type, and which were thought highly improper on their first introduction. [GAVOTTE, MINUET, QUADRILLE, POLKA, WALTZ.]

Dandelion (the English corruption of the French *dent de lion*, lion's tooth, so named from the tooth-like lobes of its leaves) is the popular name of *Taraxacum officinale*, a very common perennial weed in the northern hemisphere belonging to the sub-order *Cichoraceæ* of the order *Compositæ*. The black rhizome is roasted as a substitute for, or adulterant of, coffee, and the leaves, which form a rosette and are bitter when green, are, when blanched, an excellent salad. The peduncles of the numerous scapes are glabrous, hollow, and brittle. The

involucre consists of two whorls of green bracts, the outer reflexed and the inner spreading; all the florets are alike ligulate and bisexual with golden-yellow corollas, forming a head $1\frac{1}{2}$ inches across. The common receptacle is flat and naked, but becomes rounded after flowering, so that the fruits, which are each surmounted by a stalked pilose pappus, form a white globe nearly 2 inches in diameter. The plant flowers from April to August, the heads only remaining expanded from about 5 a.m. to 9 p.m. The whole plant contains abundant milky latex, which coagulates on exposure, becoming a violet-brown. It contains caoutchouc and a diuretic principle, *taraxacin*. An infusion, decoction, and extract of the root-stock are employed medicinally as mild laxatives and tonics, acting especially on the liver.

Dandie Dinmont. [TERRIER.]

Dandolo, HENRICO, Doge of Venice, was elected to that office when in his 84th year, having previously been sent as ambassador to Constantinople in the year 1173, where he was imprisoned by order of the Emperor. On his return he prosecuted with energy the war with the Pisans, and in 1201 at their earnest request placed himself at the head of the Crusaders, and, after reducing Trieste and Zara, in 1203 captured Constantinople. On the murder of the Emperor Alexius the following year, he again laid siege to and carried that capital by storm, and established Count Baldwin on the throne. During his term of office, owing to his exceptional abilities both as a statesman and a general, the dominion of Venice was widely extended. He died in 1205.

Dandy Fever. [DENGUE.]

Danegeld, in English history, a tax on cultivated land first imposed, in 991 A.D., by Ethelred the Unready, on the advice of Archbishop Sigeric, to buy off the Danish invaders. (Much Anglo-Saxon coin of about this date has been found in Denmark and Sweden.) It was abolished by Edward the Confessor, having been continued long after it had ceased to serve its purpose. William the Conqueror re-imposed it, and tripled the amount in 1084. Stephen promised to abolish it. Henry II. did so in 1163, though he taxed the land as much under other names. Richard I. virtually revived it as carucage. It was probably the first money tax paid in England.

Danelagh, or DANELAGU, in English history, the part of England subject to Danish as distinct from that subject to Anglo-Saxon law and custom. By the treaty of Wedmore (879) between Alfred the Great and Guthrun, its boundaries were defined thus:—"From the mouth of the Thames to the Lea, up the Lea to its source, thence to Bedford, and along the Ouse to Watling Street." In its greatest extent, however, it may roughly be described as extending from the Thames to the Tees, and far enough west to include the counties of Bucks, Northampton, Leicester, and Notts. But the degree of Danish influence in different parts of this district varied considerably. In Yorkshire and Lindsey, in Lincolnshire, the land was divided into

ridings or trithings and wapentakes (q.v.), the latter equivalent to the Saxon hundred; no trace of this division is found in East Anglia, and it was only partial in the Midlands. The evidence of local names (e.g. the endings *thorp*, *by*, and *caster*) shows that the Danish settlement was far more complete in Yorkshire and Lindsey than elsewhere. It is not clear what the precise difference between Danish and Anglo-Saxon law consisted in, and there was certainly a close resemblance between their leading features. The distinction, however, is recognised as late as the reign of Stephen.

Dánga, a district of the Bombay Presidency, with an area of 1,000 square miles. Timber abounds, but the rainfall is excessive, and the climate unhealthy. The country, which is surrounded by hills, is governed by native chiefs. The products, with the exception of timber, are unimportant. The Bhils rank first among the forest tribes, of which the population is composed.

Daniel, SAMUEL, English poet and historian, was born in Somerset in 1562, and, after studying at Oxford University, became tutor in several distinguished families, and devoted his leisure time to the composition of poetry and the compilation of his history. The close of his life was spent on a farm at Beckington. Though his sonnets are above the average, his poems generally, though not wanting in sweetness, are deficient in force and vitality. His best known works were a poem entitled *A History of the Civil Wars between York and Lancaster*, and his *History of England* down to the time of Edward III. He died in 1619.

Daniell, JOHN FREDERICK, D.C.L., chemist, was born in London in 1790, and, forsaking business for science, was elected F.R.S. in 1814, and in 1831 obtained the chair as chemical lecturer at King's College, a post occupied by him till his death, which occurred in 1845. In 1839 he was offered and accepted the foreign secretaryship to the Royal Society. He was the author of *Meteorological Essays*, an *Introduction to Chemical Philosophy*, and was the inventor of a hygrometer. He was, moreover, the first person to obtain the three medals in the gift of the Royal Society.

Daniell's Cell, in *Electricity*, was the earliest of two-fluid batteries, where the deposition of hydrogen on the positive plate was avoided by its transfer to a solution of copper sulphate, and a deposition of copper effected instead. In its simple form it consists of a copper plate dipped into a saturated solution of copper sulphate. A porous pot, containing a stick of zinc in dilute sulphuric acid, is placed in the copper solution. When the zinc and copper are joined by a conductor the zinc begins to dissolve in the acid, hydrogen is evolved by this action, it is handed through the porous pot to the copper sulphate, and by combining therewith forms sulphuric acid, and sets free copper which is deposited on the copper plate. Thus the one solution becomes less acid and the other one more so; the stick of zinc diminishes in size and the copper plate increases. [BATTERY, ELECTRICITY.]

Danites, or "destroying angels," were an organised band of Mormons intended to prevent the entry into the Mormon territory in Utah of other than Mormon immigrants. Shocking stories were told of the atrocious cruelties perpetrated by them on inoffensive non-Mormon immigrants. The worst of these—the massacre of 100 persons at Mountain Meadows Creek—was committed in 1857, but not punished till 1877, when a leading Mormon, John D. Lee, was convicted of participation in it and shot. The opening of the Pacific Railway made such attempted prevention hopeless. [MORMONISM.]

Dankâli (plural *Danâkil*), a large nomad people of north-east Africa, whose domain comprises all the low-lying coastlands between Abyssinia and the Red Sea, and extending from the neighbourhood of Massawa southwards to the Strait of Babel-Mandeb and Tajura Bay, a total area of about 35,000 square miles. The *Afars*, as they call themselves, Dankâli being their Arab name, are not negroes, despite their dark complexion, but are akin to their northern neighbours the Bejas [BEJA], and to the Gallas and Somals on their southern frontier. Jointly with these and with some scattered groups in Abyssinia, they form the Eastern or Ethiopic Division of the Hamitic Family [HAMITIC RACE], which extend from about the equator along the seaboard north to Egypt. The Afars, like all nomad people, are divided into a great number of clans or family groups (wrongly called tribes), of whom over 150 have been enumerated, all regarding themselves as equally independent under their several "Ras," or secondary chiefs, while recognising the suzerainty of three great chiefs, or "Sultans," residing at Tajura, Aussa, and Rahhita. The best known tribal divisions going southwards are the Saho, Haddarom, Dahimere, Dumbheito, Dodo Huru (Taltal), and Adail, this last being the most powerful, and applying to the whole nation by the name of *Adail*. In time of war the western tribes, who are under the name of Debeni, have been strong enough to drive the Abyssinians to the west, and the Italians advanced from the east. They are a fierce, warlike people, of a tall, slim and elegant physique, with a straight nose, and a regular European countenance. The national weapons are the bow and arrow, and the ox-hide shield, for which they are famous. They have been for many years a great scourge to the interior much as the pagans or else the Christians. They have been the pursuit being the foot of the Afar tribes have been the colony of Eritrea. *General to Ankober*, *Journal of the Royal Geographical Society*, vol. xxxix, *Annals of Ethiopia*, *Journey through the*

Afar Country, *Journal Royal Geographical Society*, vol. xxxix.

Danneker, JOHANN HEINRICH, a German sculptor, was born at Stuttgart in 1758, and studied at Ludwigsburg, Paris, and finally Rome, where he had the good fortune to form the acquaintance of Canova, Goethe, and Herder. On his return to Germany he was in 1790 created professor of sculpture in the Academy of Stuttgart by the Duke of Wurtemberg. His female busts are especially deserving of praise, as well as his *Christ, Faith, Ariadne on the Leopard*, and his busts of Schiller, Gluck, and others. He died in 1841.

Dante Alighieri, Florentine poet, was born at Florence in May, 1265. The name Dante is a familiar abbreviation of *Durante* (as we have Bice for Beatrice); and the surname Alighieri, or Aldighieri, seems to have come into the family, who were originally Elisei, with the poet's great-great-grandmother, who belonged to Ferrara. Between her time and that of Dante two of the line—one of them Dante's father—were christened Aldighiero; and the name seems to have been the accepted patronymic when he was born. The family belonged to the *popolani* or burgher class, and like that class in general to the *Guelf* party. To explain this term shortly, it should be stated that during the 13th century Central Italy possessed no central government, but was divided into a number of small states, each depending on some city, all independent of, and generally at war with, each other. All recognised more or less the overlordship of the Roman Emperor, who at that time was usually a German by birth; but in practice they took very little heed of him, while the Popes of Rome, being close by, could exercise a more constant influence. Consequently two great parties came into existence, taking their names from those of certain German families, which in a former struggle for the Imperial Crown had been used as party cries. For Italy the origin of their names was forgotten. The Guelfs represented the cause of municipal independence and, therefore, of the retention of the division into small communities; the Ghibelines, who comprised most of the noble families—these being largely of Teutonic origin—supported the imperial authority and so far the unity of Italy. For the most part the Popes favoured the Guelfs, and these again, in their hostility to the empire, were largely responsible for the interference of the French in Italian affairs. At the time of Dante's birth the Ghibelines had for the moment the upper hand at Florence, and the leading Guelfs were in exile, but before long the victories of Charles of Anjou over the last scions of the Hohenstaufen family, Manfred and Conradin, broke down the Ghibeline power practically for ever. In 1273 they returned for a few years, but in 1275 they were finally banished; and from that time Florence was the mainstay of the Guelf party. In so restless a population, however, new divisions were sure to manifest themselves. In 1300 a quarrel, having its origin in a family feud at Pistoia, was transferred to Florence, and the Guelfs were divided into two parties, known as

"Blacks" and "Whites." These were headed respectively by the families of the Donati and the Cerchi. The former, representing the old Florentine burgher blood, had now grown into an overbearing aristocracy, while the latter, originally immigrants from the country districts, were more or less the popular party. Party feeling rose to a high pitch, and encounters took place in the streets. At length Pope Boniface VIII. intervened, and sent for the leaders to Rome. Vieri de' Cerchi, the chief of the White party, treated the matter contemptuously, and set the Pope against him. Boniface then sent Cardinal d'Acquasparta to Florence as mediator, but with no result. From June to August, 1301, Dante was one of the seven "Priors," who were elected every two months to act as the governing body of the republic; and in that capacity he took a share in the opposition to Boniface. In the following year Charles of Valois, brother of the King of France, was called in by the Pope to act the part of "pacificator" in Tuscany. He took the side of the Blacks, and the Whites, including Dante, were banished. After this they made common cause with the Ghibelines, and were finally merged in that party. Several attempts to return by force of arms were defeated, and Dante never entered his native city again.

After this digression, rendered necessary in order to show Dante's position with reference to the politics of his time, we can revert to the story of his life, so far as it is known. Several biographies of him were written in the course of the fourteenth and fifteenth centuries; but even the earliest of these, written by Boccaccio within fifty years after Dante's death, cannot be taken as a very trustworthy authority, and others are of even less value. From the poet's own writings we know the date of his birth as already given, and that at the age of nine he met at a gathering of children a little girl one year younger than himself, who exercised a strange attraction upon him. He did not see her again for nine years, and then became deeply enamoured of her. It does not appear that they ever had more than the most distant acquaintance; and in due course she married another man, and died when Dante was twenty-five. A few years later he himself married Gemma Donati, by whom he had a large family. At the same time he represents himself as utterly overwhelmed by the loss of his early love, treating it, indeed, as a national calamity. Of her name he only tells us that it was Beatrice; but she was very early identified with the daughter of a Florentine gentleman, Folco Portinari, and the wife of Simone de Bardi. Some modern critics, indeed, have supposed that she is purely an abstraction. But no one is likely to take this view who is acquainted with mediæval methods of expression and mediæval amatory literature; nor, indeed, is it at all probable that Boccaccio, who must have spoken with many persons to whom the circumstances were known, should have made a mistake. Of Dante's life before his exile we know, besides what has been stated above, very little. He took his share in civic and military duties; he may have been present at the

battle of Campaldino between the Florentine Guelphs and the Ghibelines of Arezzo in 1289, when the latter were defeated; and he tells us himself that he was present when the fortress of Caprona was surrendered by the Pisans in the same year to a mixed force of Florentines and Lucchese. At the age of thirty he took a step required by the constitution of Florence from every citizen who wished to take a share in the government, by joining one of the seven "greater arts" or guilds. The one selected by him was that of the apothecaries or medical men. It is said that the trade in manuscript books was in the hands of this guild, which probably determined Dante's choice. There is documentary evidence of his having been a member of the Council of the *Podestà* or chief magistrate and of other bodies of the same kind; and, as we have seen, in 1300 he served the office of Prior. All this time he must have been studying with vast diligence. In his knowledge both of literature and of science, moral and physical, he was surpassed by none of his contemporaries. "A great man of letters was he in almost every science, for all that he was a layman," says the historian John Villani, who knew him personally. His bent for study seems to have been encouraged by the famous Florentine *savant* and statesman, Brunetto Latini, who was an old man when Dante was a lad, but there is no evidence to show that he was ever, in the ordinary sense, Dante's tutor, as is often asserted.

After his banishment Dante visited for purposes of study Bologna and Paris, "and more parts of the world," says Villani. Some writers have imagined that England was among them, and that he visited Oxford. Of this it can only be said that we do not know that he did not. The only evidence for it is found in some Latin verses of Boccaccio's, where the words "*visit extremos Britannos*" are as likely as not to be a poetical exaggeration. Mainly, however, his time was spent in wandering about Italy. He was for a time at Verona, under the protection of the great family of La Scala; and we can trace him elsewhere by scraps of evidence from legal documents in which his name appears as that of a party or a witness. Thus we know that he was in Padua in August, 1306; and that later in the same year he went to the Marquis Malaspina in the Lunigiana, or country north-west of Pisa. His journey to Paris probably came after this. But his wanderings were cut short by the arrival, in 1310, of the newly-elected emperor, Henry of Luxemburg, in Italy, and Dante with other exiles hastened to join him. Shortly afterwards he addressed, from the confines of Tuscany "near the head-waters of the Arno," a letter to his fellow-citizens, full of taunts and reproaches, which they answered by renewing the sentence of banishment; and another to the emperor, urging him on to the task of subduing the city. Henry, however, passed Florence, and went on to Rome, where he was crowned by Cardinal Fieschi (the Pope was of course at Avignon) in June, 1312. On his return he besieged Florence for a month, withdrew to Pisa, and moved south in the next summer to attack the kingdom of Naples, which was a stronghold of the

French party. At Siena he was taken ill, it was thought from poison, and died at Bonconvento August 24, 1313. With him the last hope of the Ghibeline cause vanished, and with it Dante's hopes of an universal empire. His successor, Lewis the Bavarian, kept up the struggle a little longer; but from that time the empire became more and more a German sovereignty. Dante became again a wanderer. After Henry's death he is said to have withdrawn for a time to the monastery of Croce d'Avellana, near Agubbio. On the death of Clement V., in 1314, he wrote a letter addressed to the Italian cardinals, with the hope of inducing them to elect an Italian Pope and restore the Holy See to Rome. In the summer of the same year the Ghibeline cause looked for a moment prosperous, under the famous leader Uguccione della Faggiuola; and Dante hastened to join him at Lucca. In August, 1315, Uguccione defeated the Florentines heavily at Montecatini, but in the following spring he was himself driven out. About this time the Florentines offered to their banished citizens permission to return, but only on condition of their submitting to the humiliation of a public confession of misdoing. In a letter "to a Florentine friend" Dante rejects this offer indignantly. "Far from the man, whose comrade is philosophy," he says, "be this baseness, fit only for a heart of mire." His last home was found at Ravenna, where he was honourably received and protected for the rest of his life by Guido of Polenta, lord of that town and of Rimini. Once he went back to Verona, on a visit to Can Grande della Scala, son of his old protector, Bartolommeo. His last public service was rendered in 1321, when he went as ambassador from Ravenna to Venice on behalf of the lord of Polenta, who was threatened with war from his neighbour. He returned ill, and died at Ravenna in (or September), 1321. His tomb is still to be seen.

Dante is, in the eyes of posterity by his great poem, *Divine Comedy*, which he left unfinished at his death. The epithet "Divine" has since been known. He is called the "comedy" by Can Grande della Scala (by the aid of some cultivated friends) which begins in a state of sorrow and ends happily. It was entirely written after his death, and represents the journey which he made under the guidance of Beatrice, through the three kingdoms of Hell, Purgatory, and Heaven, and not only fits a general philosophy and theology, but is in his contemporary persons of the first great and remains incomparable in beauty. The story is related in

the mystical style of the time. Later he began *The Banquet*, a kind of prose summary of his ethical and social creed, in the form of a commentary on certain of his odes. Of the projected fourteen books only four were written, but these form a valuable aid to the study of the *Commedia*. In Latin he wrote a treatise, *Of Monarchy*, expounding his views as to the government of mankind, and maintaining his theory of the empire. It is a wonderful monument of scholastic argumentation. He also began, but did not complete, a work, *On the Vulgar Tongue*, an attempt to settle a common form of the Italian language, interesting as an early attempt at scientific philology; and an *Enquiry Concerning Land and Water* (of not quite certain authenticity), which purports to have been delivered at Verona in the year before his death.

Danton, GEORGE JACQUES, a French revolutionist, was born at Arcis-sur-Aube in 1759, and subsequently called to the bar, but, on the outbreak of the Revolution, threw up his profession, and became a leading spirit in the iconoclastic movement of the time. After founding the Club of Cordeliers in 1790, in conjunction with Marat and Desmoulins, in 1792 he became Minister of Justice, and from the tribune, stalwart in figure and powerful in lung, poured forth words of impassioned eloquence which roused the people to frenzy. He voted for the death of the king in 1793, and was mainly instrumental in the establishment of the Committee of Public Safety. He now turned his attention to crushing the moderate party known as Girondists, but in doing so compassed his own death, for the Mountain or extreme party, finding their hands free, pursued a course of bloodshed that disgusted even Danton, and the latter soon found that his influence was being undermined by the austere but unscrupulous Robespierre, who rapidly gained the current of popular favour. After an ineffectual effort made to bring about a reconciliation between the rival leaders, Danton retired into private life with his young wife. Urged to strike the first blow, he remarked, "I prefer being guillotined to guillotining." In 1794 he was arrested, and, along with several friends, lodged in the Luxembourg on a charge of malversation, and after an eloquent defence, cut short by an infamous decree of the Committee of Public Safety that those who had "insulted Justice" should not be heard, was guillotined on the 5th of April.

Danube, THE, next to the Volga the largest river in Europe, has its origin in the union at Donaueschingen of two streams, the Brege and Brigach, which rise on the eastern slope of the Schwarzwald in Baden. Its general course is E.N.E. to Ulm, and thence, watering the plain of Bavaria, past Donauwörth, Ingolstadt, Kelheim, Ratisbon, Straubing, and Vilshofen, E.S.E. to Passau. From Passau it continues its course, after entering Austrian territory, past Linz to Vienna, Presburg, and Komorn, and, on reaching Waitzen in Hungary, takes an abrupt turn S., passing Buda-Pesth and continuing its course through the Hungarian plain. At Vukovar in Slavonia it again takes a S.E. course, and, after forming a boundary

thence between Hungary and Slavonia to Belgrade and later between Hungary and Servia until it reaches the point E. of Orsova, where the 'Iron Gates' used to be; this gorge was widened by blasting towards the end of the 19th century, the river then taking a more southerly course, sweeps past Widin, and about 10 miles S. of that town, turning almost due E., flows as the boundary between Wallachia and Bulgaria past Lom-Palanka, Rahova, and Nicopoli to Sistova, whence, after passing Rustchuk on its southern bank, it arrives by a N.E. course at Silistria, and enters Wallachian territory. At Tchernovada, turning almost due N., it flows past Matchin, Hirsova, and Ibraila to Galatz, and, thence taking a S.E. direction, falls by four mouths, viz. the Kilna, Stamboul, St. George's or Edrillis, and Soolina, into the Black Sea. The sportsman finds a good hunting ground in the desolate country of the Delta, which abounds in large game and countless specimens of the feathered tribe. Numerous tributaries combine to swell the waters of the Danube in its course of 1,740 miles, notably, in Wurtemberg, the Iller; in Bavaria, the Lech, the Paar, the Altmühl, the Regen, the Isar, the Vils, and the Inn; in Austria, the Traun, the Enns, and the March; in Hungary, the Raab, the Waag, the Sio, the Drave, the Theiss, and the Temes; in Servia, the Save and Morava; in Roumania, the Schyl, the Abuta, the Vede, the Arjish, the Jalomitza, the Sereth, and the Pruth; in Bulgaria, the Isker, the Vid, the Jantra and the Lom. The Danube drains 315,000 square miles in its course, and several attempts have been made to improve the navigation at the Iron Gate. In 1888 500,000 florins were voted by the Hungarian Diet for this object. The average fall of the river is 18 inches per mile. Ships enter from the Black Sea by the Sulina mouth, at which there is now a depth of 20 feet of water over the bar. It is connected with the Rhine and the Elbe by canals.

Danville. 1. A city of Illinois, capital of Vermillion county, 124 miles S. of Chicago by rail, contains several public buildings, mills, foundries, and factories. Coal-mining is extensively carried on in the neighbourhood. 2. The capital of Boyle county, Kentucky, 114 miles S. of Cincinnati, contains the Centre College, a Presbyterian foundation, containing about 150 students, dating from the year 1819. 3. The capital of Montour county, Pennsylvania, on the right bank of the N. branch of the Susquehanna, 67 miles N.E. of Harrisburg, is readily accessible by rail, and contains extensive ironworks and numerous public buildings, including a State insane asylum. 4. A city of Pittsylvania county, Virginia, on the river Dan, 65 miles S. of Lynchburg, is the S.W. terminus of the Virginia Midland Railroad. It is the seat of numerous tobacco factories and flour, grist, and cotton mills. Its trade in tobacco is very extensive.

Danzig, a commercial city and seaport, capital of the province of West Prussia, on the Vistula, is strongly fortified, and connected by rail with the principal towns of Germany. Circular in form, with four gates and nine suburbs, its general

appearance is sombre and dull. It contains a cathedral and numerous other ecclesiastical buildings, with schools, a public library, observatory, museum, hospitals, arsenal, navy yard, etc. Its principal manufactures are gunpowder, vitriol, firearms, tobacco, silks, woollens, ribbons, wire, jewellery, and gold and silver stuffs. It is the seat also of flour-mills, breweries, distilleries, sugar refineries, and dye-works. Among its exports it reckons various kinds of grain, timber, spirits, beer, zinc, linens, and flax. The city was formerly one of the Hanse Towns, under the control, first of the Teutonic knights and then of Poland, but fell to Prussia at the second partition of Poland in 1793. A canal enables large vessels to come close up to the town, which is 284 miles N.E. of Berlin by rail.

Daphne. 1. A nymph beloved by Apollo and changed by him into the laurel (Greek *daphnē*). 2. The seat of a temple of Apollo, with a grove of cypresses and laurels and a sanctuary, near Antioch in Syria. It was the scene of almost perpetual orgies of vice. 3. The name is applied in botany to the genus of shrubs belonging to the *Thymelacæ*, or lace-bark tribe. They have a tough bast; hermaphrodite flowers, which are generally fragrant; a calyx of four united and often petaloid sepals; no corolla; eight epiphyllous stamens; and a drupaceous fruit. *D. laureola*, the spurge-laurel, is a dwarf evergreen, common on calcareous soils, with greenish flowers. Several other species are cultivated.

Daphnia, a genus of crustacea belonging to the order Cladocera, and including one of the commonest and best known of the "water fleas"; this is *Daphnia pulex*, which occurs in nearly all ponds and ditches. As it is so common it serves as a good type of this group. The animal has a distinct head prolonged forward into a prominent beak; just beneath this are two pairs of antennæ; those of the posterior pair are large, branched, and jointed, and serves as the swimming organ; the anterior pair is rudimentary. From the form of these in *Daphnia pulex* this species is known as the "branched-horned water flea." The rest of the animal is enclosed in a bivalve shell: the antennæ are protruded through an aperture between the valves at the anterior end. There are five pairs of thoracic limbs; the four posterior pair are respiratory in function; they are in constant motion and give the animal a somewhat quivering appearance. The mouth is armed with three pairs of appendages, one pair forms the labrum, and behind this are the mandibles and jaws. On the head there is a single eye, very large in comparison to the size of the animal; it has about twenty lenses; it is a very familiar microscopic object. The reproduction of the Daphnias contains one point of great interest. The males are very scarce in proportion to the number of the females, but one fecundation of these lasts for life. The females produce two types of eggs; the "summer eggs" are shed into a cavity between the back of the animal and its carapace, and remain there till hatched; successive broods of these are formed, the individuals of which are all females, and these can produce other generations of

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Dardu, a historical people of the Upper Indus valley from them called Dardistan, are the Darada of the Hindu records, the Derdai or Deradai of the later Greek writers, and belong to the Galcha branch of the Aryan family, settled in their present mountain homes since the time when the Hindus first penetrated from the North-West into India. The language shows closest affinities to the Kashmiri and Panjābi Neo-Sanscrit tongues, while the type is distinctly Caucasian, resembling that of the neighbouring Siah-posh Kafirs and Kashmirians. The political organisation is based not on tribal but on caste (*i.e.* social) distinctions, the chief castes being:—1, Ronu; 2, Shin; 3, Yashkun, the most numerous, agricultural; 4, Kremin, answering to the Indian Sudras; 5, Dûms, answering to the low caste Marāsi of the Panjāb, and to the Doms of other parts of India. The inhabitants of Gilgit, Se, Haramosh, Hasora, Pumāl, Nagar, Hunza, Yâsin, Chitrâl, Mastûg, Goigâl, Darel, Tangir, Gor, Koli, Pâlus, and Chilās are all Dardus whose domain comprises the whole region of North Kashmir between Baltistan and Afghânistan east and west. A few in the eastern districts are Buddhists, but all the rest Mohammedans, who have transferred to the cow the Mussulman abhorrence of the dog and pig, otherwise a freedom-loving, independent people, but gentle, intelligent, and upright. (*See* G. W. Leitner's *Results of a Tour in Dardistan*, Lahore, 1870, and *On the Races and Languages of Dardistan*, in *Journal of the*

Ethnol. Soc., April, 1870. Fr. Drew, *The Jummoo and Kashmir Territories*, London, 1875.)

Dar-Fur, a country of Africa annexed by Egypt in 1875, in East Sûdân, bounded by Kordofan on the east and Wadal on the west, and having an area of about 450,000 square miles. A ridge of mountains, called Marrah, crosses the district, the climate of which is intensely hot. It is traversed by numerous streams, in the neighbourhood of which the soil is fertile, but much of the land is desert. The rainy season in the autumn continues for 75 days. Tobacco, rice, millet, maize, wheat, the tamarind, and date abound. Copper and iron are among its products, and an export trade is done in these minerals and ivory, feathers, and gums. The people, who are of Arab-negro race and Mohammedans, are rich in flocks, and at present own the supremacy of the Khalif Abdallah, successor to the Mahdi.

Darfuri. [FÜR.]

Darien, or PANAMA, ISTHMUS OF, is a horse-shoe-shaped strip of land uniting North and South America, and separating the Atlantic from the Pacific Ocean. It varies in breadth from 30 to 70 miles, and is bounded on the north by the Gulf of Darien, on the south by the Bay of Panama. The rainfall is heavy, and the climate unhealthy. Minerals, including gold, iron, and copper, abound, and a brisk trade is carried on in these metals and pearls by the natives with European traders. The isthmus contains a good harbour and excellent roadstead, and in parts is well wooded.

Darien Scheme. William Paterson, the founder of the Bank of England, conceived the project of opening a new trade route between Europe and the East by way of the Isthmus of Darien or Panama. He therefore induced the Scottish parliament to pass an Act in 1695 incorporating the Darien Company with very extensive powers. It was authorised to form settlements in Asia, Africa, and America, to make treaties with foreign powers, and to provide for the defence of its settlements. Civil and religious liberty was to be a feature of the government. The directorate was to be half English and half Scottish; in fact, however, the company was intended as a Scottish rival to the English East India Company, which controlled the Cape route to India, Scottish trade having been much interfered with by the Navigation Act of 1660. The Scots took up the project with enthusiasm, and capital was also subscribed in Hamburg and Amsterdam, as well as in England. Great opposition, however, was caused in England by the grant of these privileges to a company which was so largely Scottish, and the English and Dutch subscriptions were almost wholly withdrawn. The scheme, however, continued, about £400,000 (nominal) having been subscribed in Scotland. In 1698 a small squadron sailed (it would seem with a singularly unsuitable cargo), and, taking up land by agreement with the natives on the Isthmus of Darien, proceeded to found the city of New Edinburgh. They had, however, occupied territory claimed by Spain, whose government protested at

once. A second expedition sent out from Scotland arrived in 1699, but found that the first had deserted the city and left for New York. A Spanish squadron now anchored off the town, and after lengthy negotiations the colonists abandoned the scheme altogether in April, 1700. Quite half of them perished, chiefly from disease. Paterson escaped, but for a time became insane through his sufferings. His scheme, it may be noted, included a Panama Canal.

Darius I., King of Persia, son of Hystaspes, ascended the throne after the death of the usurper Smerdis, 521 B.C., and in the belief that his life was in danger, caused Intaphernes, one of seven conspirators who had effected the death of Smerdis, to be put to death. After this he reigned supreme, and turned his attention to the consolidation of his empire, uniting himself by marriage with the royal house, and making Susa his capital. After suppressing numerous revolts and dividing the empire into twenty satrapies, he turned his mind to enlarging his dominions, the confines of which he advanced to the Caucasus and Indus, but in 515 B.C. he signally failed in an expedition against the Scythians, losing 80,000 men. Thrace having been conquered by his general, Megabazus, after an interval of peace Darius carried out his probably long-cherished plan of an invasion of Greece, and crossed the Hellespont, but suffered a signal defeat at Marathon 490 B.C. He died 485 B.C., when a rebellion in Egypt was in full force, and during preparations for a third invasion of Greece.

Darjeeling, or DĀRJĪLING, a town and seat of the executive of Darjeeling district on the Himalayas, Bengal, acquired by the Government as a sanatorium in 1835, stands on a lofty eminence with wooded valleys on each side. It is a favourite resort for visitors and invalids, and the health station of the Lieutenant-Governor of Bengal. The scenery of the district, which has a moist, yet healthy climate, cannot be surpassed. Its mineral products include coal, iron, copper, and slate, and its principal industry is the manufacture of tea. Good pasturage exists in the government forests and on the more lofty mountains, and game, large and small, is fairly abundant.

Darling, a tributary of the Murray, in Australia, 1,160 miles in length. It has its source in the N.E. of New South Wales, and, taking a S.W. course, forms the boundary between Queensland and New South Wales. It has numerous tributaries, including the Macquarrie, the Namoi, the Castle-reagh, and the Warrego.

Darling, GRACE, daughter of the keeper of the Longstone lighthouse on the Farne Islands, was born at Bamborough in 1815. In 1838 a steamer, named the *Forfarshire*, struck on the rocks of the islands; and after a portion of the crew had escaped by boat and another portion been washed overboard, Grace Darling and her father, while a tremendous sea was running, at the imminent risk of their lives put off from the lighthouse and rescued the survivors. A large subscription was

raised on her behalf. She died of consumption, in 1842.

Darling Downs, a range of hills, elevation 2,000 feet, of Queensland, Australia. The district, which has an area of 6,000 square miles, contains fine pasturage as well as excellent agricultural land.

Darling Range, a chain of mountains of West Australia, running parallel with the coast, varying in height from 1,500 to 2,000 feet, and rich in sandalwood and timber.

Darlington, the cradle of our railway system, is a parliamentary borough with municipal rights in the S.E. of the county of Durham, overlooking the Skerne, 4 miles S. of Stockton. Here are numerous factories for making and repairing locomotives and rolling stock, rail-mills, wool mills, blast furnaces, and iron and steel works. The town contains several fine public buildings, including a free library opened in 1885, the fine collegiate church of St. Cuthbert, the original building dating back to the 12th century, numerous schools, banks, and churches of lesser note, and a commodious railway station newly built. Darlington was enfranchised in 1867, and returns one member. (Pop. 1901, 44,496.)

Darmstadt, a town of Germany, capital of the Grand Duchy of Hesse-Darmstadt, on the river Darm, 15 miles S. of Frankfort, consists of an old and new town, the streets of the former being confined and irregular, while the latter has broad and well-made thoroughfares. Both towns are enclosed by a wall, and contain many buildings of interest as well as promenades and public gardens. The most noteworthy structures are the ducal palaces, old and new, the former containing valuable works of art, the palaces of the princes, the post-office, and the opera-house. There are manufactures of tobacco, paper, gloves, chemicals, cards, hats, and wax candles.

Darnley, a Scottish nobleman, husband and cousin of James Douglas, Earl of Morton, and eldest son of the Earl of Morton. His marriage was dissolved by the Earl of Morton's violent temper, dissonance with the Earl of Morton, and his death by a gunpowder explosion at Holyrood.

Dart, a river of Devonshire, England, rises in the Dartmoor, and flows into the English Channel at Dartmouth. It is a picturesque river, with steep rocky slopes, and the streets are mounted by steps. There are the remains of an old castle, and among the churches the fourteenth-century church of St. Saviour is notable, and contains a handsome rood-loft and stone pulpit. The harbour, the entry to which is protected by a battery, is deep and well sheltered. Many yachts use it, and the Castle Line of steamers for South Africa call for the mails. The trade of the town is considerable. Dartmouth has played a considerable part in history. The Crusaders of Richard Cœur de Lion started from it, and it was attacked in 1404 by the French, who were repulsed by the women. It supplied ships for the invasion of France. (Pop. 1901, 6,579.)

Dartmoor, a large moorland and forest tract of West Devonshire. The forest rights belong to the Duchy of Cornwall. The only timber the moor produces is dwarf oak, ash, and willow. Extending 20 miles from N. to S., with a breadth of 20 miles, and an area of about 150,000 acres, the surface is mountainous and rugged, and abounds in tors, of which Yes Tor has a height of 2,050 feet. In swamps on the moor the rivers Dart, Teign, and Taw, as well as others, take their rise. A prison, which was built for French prisoners in the early part of the 19th century, has since been turned into a convict prison, and is surrounded by a district which has been brought into cultivation. The settlement of over 30 acres takes its name from the adjoining village of Princetown. In summer cattle and sheep are pastured on the moor, but in winter it is a stormy, forlorn, and desolate region. Tin, copper, and iron have been worked, and gold has been found in the rivers. Attempts, too, have been made to utilise the peat, which is plentiful, but little success has attended them. The chief product is china-clay. It is a bleak bare upland moor of heather and peat-bog rising into numerous summits capped by piles of remarkable detached and disintegrated granite blocks known as "tors." Some of these blocks have been hollowed into "rock-basins" by weathering. The moor is rich in stone monuments, the maenhirs, or large upright stones, lines of stones as at Carnac in Brittany, villages of round stone huts, pounds, or enclosures, with stone walls, and "clam" or slab bridges being pre-historic; whilst numerous granite crosses belong to a more modern date. Dartmoor has been a royal forest from early times.

with the Thames, and on the North Kent Railway. The ancient church has an embattled tower, and there are remains of an Augustinian convent founded by Edward III. The first English paper mill was established here, as was also the first iron rolling mill. The town has paper, corn, and oil mills, a large foundry, a gunpowder factory, and calico and silk printing works. (Pop. 1901, 18,643.)

Dartmouth, a seaport, market town, and municipal borough of Devonshire, near the mouth of the Dart, and 30 miles S. of Exeter. The town is picturesquely situated on a succession of steep rocky slopes, and the streets are mounted by steps. There are the remains of an old castle, and among the churches the fourteenth-century church of St. Saviour is notable, and contains a handsome rood-loft and stone pulpit. The harbour, the entry to which is protected by a battery, is deep and well sheltered. Many yachts use it, and the Castle Line of steamers for South Africa call for the mails. The trade of the town is considerable. Dartmouth has played a considerable part in history. The Crusaders of Richard Cœur de Lion started from it, and it was attacked in 1404 by the French, who were repulsed by the women. It supplied ships for the invasion of France. (Pop. 1901, 6,579.)

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Darts, a series of British nocturnal moths (*Noctua*) including the "Sand-dart" (*Agrotis ripæ*),

which lives among sand dunes, the "Crescent-dart" (*A. lunigera*), and the "Garden-dart" (*A. nigricans*).

Daru, PIERRE ANTOINE, COMTE (1767-1829), a French statesman and writer, was born at Montpellier. He became a soldier at the age of 16, and, having adopted revolutionary principles, he came to the notice of Napoleon, who thought highly of him and appointed him Intendant-General of Austria and Prussia in 1805 and following years. On Napoleon's return from Elba he was made Minister for War. He was appointed a member of the National Institute in 1805, and in 1815 became President of the Academy. Louis XVIII. made him a peer in 1818, but he always combated the reactionary tendencies of the Bourbons. Among his works are a *Life of Sully*, a *History of Venice*, a translation of Horace, and *Poems*.

Darwāzi, the inhabitants of the Afghan province of Darwāz between the Pamir and right bank of the Upper Oxus, are pure Aryans of Galcha stock, with mixed light and dark elements, as seen especially in the women, some of whom have European, others gipsy-like features; speech Persian, differing little from the dialect current in Bokhara; they are Mohammedans of the Sunni sect, and in other respects differ little from the Tajiks of East Turkestan.

Darwen, OVER, a municipal borough of Lancashire, situated in a valley, 3½ miles S. of Blackburn. The town is well built of stone, well drained, and has a good supply of water. Among its public buildings are a market-house, a free library, and public baths. Besides its sixty cotton mills, which contain over 400,000 spindles, there are paper, iron-casting, and earthenware industries. (Pop. 1901, 38,211.)

Darwin, CHARLES ROBERT, was born at Shrewsbury, February 12, 1809, being the grandson of Erasmus Darwin, who anticipated in his verse much of the theory of descent promulgated by Lamarck, and of Josiah Wedgwood, the famous potter. He early exhibited a passion for collecting, and the classical training of Shrewsbury grammar school, then under Dr. Butler, was irksome to him. In 1825 he went to Edinburgh University, where he made his first discovery—that of the larval nature of the so-called ova of the sea-mat—and read his first scientific paper. After two years he was removed to Christ's College, Cambridge, where the friendship of Professors Henslow and Sedgwick finally converted him from a devotee of field sports into an enthusiastic student of nature. After taking his degree in 1831, at Henslow's suggestion he volunteered to accompany Fitzroy as naturalist to the *Beagle*, in that voyage which was the main event of his life, and the narrative of which, published in 1839, was to become a classic in the literature of travel. On his return in 1836 Darwin devoted himself to the editing of the material he had collected, with the assistance of several specialists, was elected fellow of the Royal Society, and from 1838 to 1841 acted as secretary of the Geological Society, to which he contributed important papers on South American volcanoes, foliation, etc. In 1839 he

married his cousin, Emma Wedgwood, by whom he had several children, who have attained distinction in various branches of science. Darwin then settled at Down, near Beckenham, Kent, where he resided for the remainder of his life, his health having permanently suffered from the voyage. In 1842 he published his work on *Coral Reefs* (q.v.), which gave the first full and satisfactory description of the formation; in 1844, one on *Volcanic Islands*; in 1846, one on the geology of South America; and in 1851 and 1854 four volumes dealing with a known barnacles living and fossil. He thus established a reputation as a thoughtful traveller, a keen observer, a master of geological reasoning, and a cautious student of anatomy. Happening in 1839 to read Malthus's *Essay on Population*, it suggested to him the idea of natural selection, the key-note of his theory of descent, though the problem of the origin of species had engaged his thoughts when on the *Beagle*. The anonymous publication of Robert Chambers's *Vestiges of the Natural History of Creation* in 1844 stimulated his interest in his inquiries, and twelve years later, at the advice of Lyell, he began a large and comprehensive work. The discovery that Mr. Alfred Russel Wallace (q.v.) had arrived at identical conclusions led Darwin to prepare a summary of his views. This appeared as *The Origin of Species by Means of Natural Selection* in 1859, and created a profound sensation. Darwin then devoted himself to elaborating the evidence in certain special directions, especially by experiments in vegetable physiology. The *Fertilisation of Orchids* by insects formed the subject of a volume in 1862, and that of other plants was afterward dealt with. *The Variation of Animals and Plants under Domestication*, two volumes issued in 1868 in which he put forward the provisional hypothesis of pangenesis (q.v.) in explanation of heredity, were an important instalment of the evidence from one direction. In 1871 he dealt with the extension of his theory to the human species, in which he had been anticipated by Huxley, Lyell, and Hæckel, by his *Descent of Man*, in which work also he supplemented the theory of natural selection by suggesting the action of sexual selection. The following year he published the *Expression of the Emotions in Men and Animals*; and then he returned to vegetable physiology, issuing volumes on *Insectivorous Plants* (q.v.), the *Forms of Flowers*, and the *Movements and Habits of Climbing Plants*, in 1875, 1877, and 1880 respectively. Darwin died at Down, April 19, 1882, and, in accordance with the feeling of the nation, was laid beside Newton in Westminster Abbey on the 26th. His *Life and Letters* were published in 1887, his portrait by the Hon. John Collier adorns the walls of the Linnean Society, and his statue by Boehm seems to preside over the Natural History Museum at South Kensington; but the impress of his work is stamped more indelibly than that of any other naturalist since the days of Aristotle, not only upon biology, but upon many sciences apparently least likely to be affected by it.

Darwinism, a name often erroneously applied to the theory of descent, a theory which Darwin himself never originated, though he transformed it from

being some comedies; and she had a great share in producing the *Russian Academy Dictionary*.

Dasyure, any animal of the marsupial genus *Dasyurus*, with four species, from Tasmania and Australia, approaching the Carnivora in structure and habit. The canine teeth are well developed, and the premolars and molars have sharp cusps. The best known species is *D. ursinus*, the "Tasmanian devil" of the colonists. It has been compared to a small bear, with long legs and tail, but the body is only about 2 feet in length. The fur is black and coarse, with a broad white band across the chest and another over the back close to the tail. These animals are very savage, and prey on poultry, and in some cases attack sheep. Other forms are the Spotted Dasyure (*D. maculatus*), about the size of a cat; Mauge's Dasyure (*D. maugei*), still smaller; and Geoffroy's Dasyure (*D. geoffroyi*), which preys on mice, rats, and birds. None of the genus has a true pouch.

Date, the drupe-like fruit of the date-palm, *Phoenix dactylifera*, a tree 60 to 80 feet high, with large pinnate leaves, cultivated in immense quantities in North Africa, Western Asia, and Southern Europe. The stem is covered with leaf scars; the flowers are dioecious, each having a gamosepalous calyx of three sepals and three petals; there are usually six subsessile anthers and three distinct ovaries, but only one of the latter develops into the one-seeded fruit. The stony seed is mainly dense metasperm, having the walls of its cells much thickened with cellulose which is absorbed in germination. The wood of the stem is used in building; huts are built of its leaves; the petioles are made into baskets and the fibre surrounding their bases into ropes and coarse cloth; the young leaf-bud or "cabbage" is sometimes eaten as a vegetable, or, if tapped, it yields a sugary sap which may be fermented; and even the seeds are ground into meal for camels. A few years ago a company was floated for the manufacture of coffee from date-stones. In Central Arabia and some parts of North Africa the fruit forms the staple food of the inhabitants, camels, horses, and dogs also eating it. It has been shown to be the "lotos" of the lotos-eaters of ancient times, and its leaves were probably those strewn before Christ on the entry into Jerusalem.

Datia, a native Indian state of the Bundelcund district, with a population of 182,600, with a capital of the same name, 125 miles S.E. of Agra. The city was formerly of considerable importance, and contains some ancient palaces.

Dative, in grammar, the case of the "indirect object" of any action for or with reference to whom the action is done—e.g. the recipient of a gift. The term (Lat. *dare*, to give) is a Latin translation of the Greek adjective *dotikē* (connected with giving). [DECLENSION.]

Datum Level, the base or horizontal line from which in surveying all heights or depths are measured. The Trinity high-water mark, fixed in the year 1800, is the usual datum-level in the

neighbourhood of London. High-water spring tides are very generally employed.

Daubenton, LOUIS JEAN MARIE (1716–1799), a French naturalist and physician, born at Montbard. He aided Buffon in the early part of his work on *Natural History*, taking the anatomical department. But a dispute between them put an end to the collaboration. In 1745 Daubenton became keeper of the Cabinet of Natural History at Paris, and occupied himself with mineralogy, botany, agriculture, and kindred subjects. In 1778 he was appointed Professor of Natural History in the College of Medicine, and in 1785 Professor of Mineralogy in the Museum of Natural History. He was made a senator in 1799, but died at the first sitting that he attended.

Daubeny, CHARLES GILES BRIDLE (1795–1867), an Oxford professor, born at Stratton in Gloucestershire, and educated at Winchester and Magdalen College, Oxford, where he graduated B.A. in 1814, afterwards proceeding to the degree of M.D., and practising as a physician in Oxford. He made researches in Auvergne and in the United States of America, and became successively Professor of Chemistry, Professor of Botany, and Professor of Rural Economy at Oxford. In 1856 he was President of the British Association. Among his numerous writings were works on *Volcanoes*, *Mineral and Hot Springs*, *Agriculture*, *Sexuality of Plants*, and *Climate*.

D'Aubigné, JEAN HENRI MERLE (1794–1872), a Swiss ecclesiastical historian, born at Eaux-Vives, near Geneva. After studying at Berlin, he became pastor of the French Protestant Church at Hamburg. In 1823 he was appointed Court preacher at Brussels, but when Belgium threw off the Dutch supremacy in 1830 he retired to Geneva, where he became Professor of Church History in the theological seminary. He visited England and Scotland, receiving the degree of D.C.L. from Oxford, and the freedom of the city from Edinburgh. Of his writings his *Histoire de la Réformation au XVI^eme Siècle* is the best known.

Daubigny, CHARLES FRANÇOIS (1817–1878), a French landscape painter and etcher, born at Paris. He studied under his father, who was a painter, and others, and first began to exhibit in the Salon of 1838. His great characteristic was his faithfulness to nature, and many of his studies were made from a house-boat on the Seine. He was of great merit as an etcher, and was an extensive illustrator of books. Among his principal works are the *Pool of Gylien*, *Springtime*, *Windmills at Dordrecht*, and *The Rising Moon*.

Daubusson, PIERRE (1423–1503), a famous French Grand-Master of the Order of St. John of Jerusalem. He entered the service of the Emperor Sigismund, and served under the Austrian Archduke Albrecht against the Turks. Returning to France, he served with distinction against the Swiss in 1444. He then joined the Knights of Rhodes, and became Grand-Master in 1476. He was a formidable enemy of Mahomet II., and his efforts to unite Christendom against the Turkish

inroads gained for him the title of "Shield of the Church." In 1480 a force of 100,000 Turks invested Rhodes unsuccessfully for a month. The failure of this expedition aroused the wrath of Mahomet, who was meditating a greater attack when death came upon him in 1481.

Daudet, ALPHONSE, a noted French writer, born at Nîmes in 1840. He was educated in the Lycée at Lyons, and for a time was an under master. At the age of 17 he came to Paris with his brother Ernest, and the privations he underwent have been described in his autobiographical sketches. He gained employment under the Duke of Morny, who supplied him with the original of the "Duc de Moxa" in *Le Nabab*. His exquisite *Lettres de Mon Moulin*, with their vigorous delineation of Southern French life, are well known in England, as is his *Fromont Jeune et Risler Aîné*. But his popularity among us chiefly rests upon his amusing *Tartarin de Tarascon* and *Tartarin sur les Alpes*. A further set of Tartarin's adventures does not arouse the same interest. The Tarasconese were said to be furious against him. His *Sapho* is a powerful book, hardly, perhaps, suitable to general English taste. In 1887 he published *Trente Ans de Paris*, in 1888 *L'Immortel*, in 1889 *Souvenirs d'un Homme de Lettres*, and in 1892 *Rose et Ninette*. Others of his works are *Les Rois en Exil*, *Jack*, and *Numa Roumestan*. He died in 1897.

Daumer, GEORG FRIEDRICH (1800-1875), a German writer, born at Nuremberg. For a time he was professor at the Gymnasium. He then became violently anti-Christian in his views, advancing some extravagant views in his antagonism. Finally he became an ardent Ultramontane. Among his works are some poems.

Daumier, HENRI (1808-1879), a French caricaturist, born at Marseilles. He drew his subjects indiscriminately from political and social life. His earlier efforts were taken from Robert Macaire, and appeared in *Le Charivari*. In the Revolution of 1848 he produced *Les Républicains* and *Représentants*. He became blind and died in 1879. He was the brother of another artist.

Daun, LEONHARD (1705-1766), an Austrian general. His grandfather were both soldiers. He fought in the Turkish war in 1718, and in the Seven Years' war in 1734, where he served against the French in the Netherlands, and was named "the Golden Fleece." After the war of the Rhine and the capture of Maria Theresa, he was made a general, and in 1757 he commanded the Austrian army in the Seven Years' war, when he was defeated by Frederick the Great. He was one of the few generals who prevailed against Napoleon and laid siege to it and laid

Daungchi, a Bhil tribe [BHÎL], Daung district, below the Western Ghâts; the most unreclaimable of all these wild tribes, incapable of comprehending anything beyond the most simple communications; they are a stunted, sickly people, whom all attempts to civilise have failed. (See Captain Graham, *The Bhil Tribes of Khandeish*, Part II.)

Dauphin, a title originally borne by the eldest sons of the princes of Vienne and of other great feudal lords. When Dauphiné and Vienne were ceded to the French crown in 1343, Humbert II., their king, made it a condition of the cession that the title should be borne by the eldest son of the French king, and it was so borne down to the Revolution. The name, according to Littré, is a proper name—the same as delphinus, Fr. *dauphin*, a dolphin. The seigneurs of Dauphiné bore three dolphins as arms. Other and more fanciful explanations have been given—one that the word is merely a corruption of "de Vienne," assimilated by popular etymology to the spelling of the name of the fish; another that it arose from the fact that a dolphin was the crest of one of the Counts of Vienne.

Dauphiné, an ancient French province in the old kingdom of Burgundy, divided into Upper and Lower, and making up what are now the departments of Isère, Hautes Alpes, and part of Drôme, lying between Savoy and Provence on N. and S., and Piedmont and the Rhone on E. and W. The capital was Grenoble. From 1032 to 1043 the province was German.

Dauri (DAUCHERI, TAGÛRA), a Manchu people formerly occupying the region from them still known by the name of Dauria; driven thence by the Tunguses, farther east to the valley of the river Nun, where they are now settled, and largely assimilated, in dress, customs, and religion, to the Chinese. They are a fine race, tall, symmetrical, and robust, occupied exclusively with agriculture. Though nominally Buddhists, some still practise Shamanistic rites.

Dauw. [ZEBRA.]

Davenant, SIR WILLIAM (1605-1668), an English poet and playwright, generally thought the son of an Oxford innkeeper, but by some said to be an illegitimate son of Shakspeare. After passing some time at Lincoln College, he became a page in the households, successively, of the Duchess of Richmond and of Lord Brooke. He organised masques, and in 1637, at the death of Ben Jonson, he was appointed Poet Laureate. His Royalist sympathies caused his arrest in 1641, but he escaped to France, and shortly returned with supplies for the king. In 1643 the king knighted him for his services at the siege of Gloucester. Soon after he retired to France, became Catholic, and was attached to the service of the Princess Henrietta. He at this time began an epic poem, *Gondibert*. While trying to lead a French colony to Virginia, he was captured, and was for some time a prisoner at Cowes, where he went on with *Gondibert*. In 1650 he was tried, and is said to have been saved by the efforts of Milton, whose services he requited in like manner

after the Restoration. After two years' imprisonment he started a theatre, and after the Restoration he managed and wrote for a theatre in Lincoln's Inn Fields. Besides his unfinished *Gondibert*, he wrote dramas and masques, and also helped Dryden to spoil Shakspeare's *Tempest*. He was buried in Westminster Abbey.

Davenport, founded in 1836, the capital of Scott county, Iowa, U.S. America, near Rock Island and the rapids of the upper course of the Mississippi. The town is built of brick, and has many churches, colleges, and other public buildings. There are steam-mills, and the splendid water-power is greatly utilised. The town has a large grain trade.

David, the second King of Israel, succeeded Saul, and is considered to have lived about the 11th century B.C. Born at Bethlehem of the family of Jesse and the tribe of Judah, he was anointed by Samuel, and after a life of adventure he became first King of Judah at Hebron, and seven years after King of Israel, choosing for his capital Jerusalem, which he took from the Jebusites. He was the great Hebrew hero, endeared to the race by his virtues and, perhaps, not less by his very human failings. His history is detailed in the books of Samuel and in the Chronicles, and is furthermore so familiar to all that it is needless to do more than allude to his appearance in the household of Saul and his friendship with the king's son, Jonathan, to the danger he ran at the hands of the capricious and mad king, to his exile and training of a bandit troop, and to his lamentation over the deaths of Saul and Jonathan. For thirty-three years he reigned, making many conquests among the neighbouring people, and suffering much through his sons like Henry II. of England. He was succeeded by his favourite son, Solomon, son also of Bathsheba, whose seduction, followed by the murder of her ill-fated husband Uriah, forms the greatest blot upon King David's character. The majority of the Psalms are attributed to David by tradition, but recent critical research tends to increase the number of those assigned to a later date. [PSALMS.]

David, FELICIEN (1810-1876), a French composer, born at Cadenet in the department of Vaucluse. He was a chorister at Aix cathedral, and afterwards went to the Paris Conservatoire. He adopted the principles of St. Simonism, and with others went to Constantinople, Smyrna, and Cairo, and suffered much tribulation. On his return to Paris he published in 1835 his *Mélodies Orientales*, and in 1844 his *Désert*, which had a great success. Later works did not meet with the same success. In 1862 he was enrolled in the Legion of Honour, and in 1869 he was appointed librarian of the Paris Conservatoire.

David, FERDINAND (1810-1873), a famous teacher of the violin. He was born at Hamburg, and became a pupil of Spohr. In 1836 he was appointed concert-master at Leipzig, and here he had some of the best players as pupils. He was the author of some good compositions.

David, GERHARD (1450-1523), a Dutch painter, born at Oudewater. In 1484 he became a member of the Painters' Guild at Bruges, and in 1501 was Dean of the Guild. His subjects were chiefly religious, and specimens of his work are to be seen at Rome, Berlin, Bruges, and the National Gallery, London.

David, JACQUES LOUIS (1748-1825), a painter of the modern French school, of which he may almost be called the founder, since he introduced the close study of nature to take the place of the conventionalism till then existing. He was born at Paris, where he studied, and having gained the Grand Prix, went to Rome from 1775 to 1780. His great forte was historical painting, and in 1784 he finished at Rome his noted *Oath of the Horatii*, a work which had been commissioned by Louis XVI. In the same year he produced his *Belisarius*, in 1787 *The Death of Socrates*, and in 1788 *Paris and Helen*. He also made some reputation as a portrait painter. Having entered fully into the principles of the Revolution, he painted in 1789 *Brutus condemning his Sons*. He became a deputy to the National Convention in 1792, and was a staunch adherent of Robespierre. He voted for the death of his old patron, Louis XVI., and in 1794 he presided over the Convention. In 1799 he painted the *Rape of the Sabine Women*. Appointed first painter by Napoleon in 1804, he painted the *Coronation* and *Napoleon crossing the Alps*, and in 1814 he painted his *Leonidas*. After the return from Elba he was made a Commander of the Legion of Honour. At the fall of Napoleon David was banished, and went to Brussels, where he painted *Cupid leaving the Arms of Psyche*; and his last work, in 1824, was *Venus, Cupid, and the Graces disarming Mars*. Many of his pictures are in the Louvre. He excelled as a colourist, and his drawing was correct. Moreau engraved many of his works.

David, St. (about 601), the patron saint of Wales, was first Archbishop of Caerleon, and then of Menevia (now St. David's). Not much is known of him, though legends speak of his piety, of his energetic opposition to Pelagianism, and of miracles wrought at his tomb. He is said to have written some theological treatises.

David I. (1084-1153), (sometimes called Saint, though never canonised), King of Scotland, son of Malcolm and St. Margaret. In his youth he went to England with his sister Matilda. In 1107, when his elder brother became king, David was made Prince of Cumbria, and in 1110 he married Matilda, heiress of Waltheof, and thereby became Earl of Huntingdon and Earl of Northampton. In 1124 he came to the Scottish throne, and for some years was occupied by battles against tribes of his wild subjects. He took part with Matilda against Stephen, and advanced into England as far as Durham, where he made peace with Stephen. In 1138 he again engaged in war with England, but, deserted by his Norman nobles, he was defeated at the battle of the Standard at Northallerton. He did much towards uniting and organising his kingdom, and was especially active in endowing

bishoprics and founding abbeys, by which he reduced his revenues so greatly that one of his successors declared him to have been a "sair saint for the crown."

David II. (1324-1371), King of Scotland, son of Robert Bruce. He was born at Dunfermline, and married Joanna, daughter of Edward II. He succeeded to the crown in 1329. From 1334 to 1341 he was in France, owing to the predominance of Baliol and of Edward III. In 1346 he declared war upon England in accordance with a promise which he had made in France, and was taken prisoner in the battle of Neville's Cross, and remained a prisoner till 1357, when he was released upon promising to pay a ransom. Unable to pay this, he was for the rest of his life more or less bound to England, and is even said to have proposed a son of Edward III. as his successor, a measure which did not endear him to his subjects.

Davies, Sir John (1570-1626), an English poet and statesman, was born in Wiltshire. He was educated at Queen's College, Oxford, and in 1595 was called to the bar, but was shortly afterwards disbarred for striking a fellow barrister who insulted him. He returned to Oxford in 1599, and there produced a work on the immortality of the soul, under the title of *Nosce Teipsum*. In the same year he published a set of Elizabethan acrostics, called *Hymns to Astræa*. In 1601 he was readmitted to the Middle Temple, and was elected M.P. for Corfe Castle. In 1603 he became James I.'s Solicitor-General for Ireland, and in 1606 he was knighted, made serjeant-at-law, and Attorney-General. He sent home some valuable reports upon the state of Ireland, and had a great share in the planting of Ulster. Returning to England, he was again elected to Parliament, and was nominated Chief Justice, but death prevented his exercising the functions of the office.

Davila, Giovanni (1576-1631), an Italian historian, was born at Cyprus. At the age of 15 he came to Italy, and in 1561 his father sent him to the service of the Duke of Savoy, a page at the court of France, which service, which he continued till 1599. He was then sent to Friuli, and then to the Doge's service in a dispute between Venice and the Turks for his travels.

Davis, John (1814-1845), an Irish poet and patriot, born at Mallow, his father being an army surgeon. He was educated at Trinity College, Dublin, and afterwards visited London and the Continent. In 1838 he was called to the bar. He was an advocate of Repeal, and became co-editor with John Dillon of the *Dublin Morning Register*. In 1842 he became connected with the *Nation*. Besides poems and essays, he published the speeches of Curran, and produced other works.

he was Secretary for War, after which he again became senator. As President of the seceding States (1861-65) he showed great organising power. He was the last to admit defeat, but, when Richmond fell in 1865 and all hopes were ended, he fled. Being accused of complicity in the murder of President Lincoln, he was arrested and imprisoned in Fort Monroe. After three years of captivity he was released, and retired into private life. He published in 1881 a *History of the Rise and Fall of the Confederate Government*.

Davis, John, one of the greatest of English navigators, was born at Sandridge, near Dartmouth, about the year 1550, and was in youth the friend of Humphrey Gilbert and Walter Raleigh. He very early went to sea, and was by 1579 a captain of considerable reputation. In 1585, with the *Sunshine*, 50 tons, and *Moonshine*, 35 tons, he sailed from Dartmouth, hoping to discover a north-west passage to India and China. In this voyage he explored much of the south coast of Greenland, and then, crossing what is now Davis Strait, discovered Mount Raleigh and Totnes Road in what is now Baffin Land. In 1586 he made a second voyage with the *Mermaid*, 120 tons, *Sunshine*, *Moonshine*, and *North Star*, 10 tons, and got as far north as Rommel's Fiord, on the east coast of Baffin's Bay, part of the flotilla returning by Cumberland Gulf and the Labrador Coast. A third voyage, begun in May, 1587, was continued as far north as Sanderson's Hope. In 1588 Davis, as captain of the hired vessel *Black Dog*, 20 tons, served against the Armada, and it was in memory of this that he afterwards dedicated his manual of navigation, entitled *The Seaman's Secrets*, to Lord Howard of Effingham. In 1589 he joined Cumberland's expedition to the Azores. In 1591, with Cavendish, he embarked on the unfortunate voyage to the Strait of Magellan, a full account of which, by John Janes, is in the Hakluyt collection. In this expedition he discovered the Falkland Islands. His subsequent voyages, three in number, were to the East Indies. In the last of them he was killed, off the coast of Pahang, by some Japanese pirates, on Dec. 27, 1605. *The Seaman's Secrets* was first published in 1594. At about the same time this great seaman invented the "back staff" or "Davis' quadrant," an instrument which superseded the "cross staff" for observing latitude, and remained in general use until 1731.

Davis, Thomas (1814-1845), an Irish poet and patriot, born at Mallow, his father being an army surgeon. He was educated at Trinity College, Dublin, and afterwards visited London and the Continent. In 1838 he was called to the bar. He was an advocate of Repeal, and became co-editor with John Dillon of the *Dublin Morning Register*. In 1842 he became connected with the *Nation*. Besides poems and essays, he published the speeches of Curran, and produced other works.

Davis Strait, between Baffin's Bay and the Atlantic Ocean, separates Greenland from Cumberland Island and British North America. It is in lat. 60° 70' N., and is 220 miles broad at the Arctic

Circle—its narrowest part. The east coast is rocky and studded with islands; the west coast has some deep indentations, the chief being Hudson's Strait, the entry to Baffin's Bay, and Northumberland Inlet.

Davitt, MICHAEL (b. 1846), a well-known Irish patriot, born in the county Mayo, the son of a Mayo peasant. He was evicted with his family in 1851, and they emigrated to Lancashire, where Michael had the misfortune to lose his right arm by an accident in the cotton factory where he worked. In 1866 he became a Fenian, and in 1870 was sentenced to fifteen years' penal servitude. Released upon a ticket of leave in 1877, he founded the Land League in 1879. In 1881-82 he was sent to Portland on the ground of having broken the conditions of his ticket of leave. In 1885 he published *Leaves from a Prison Diary*, and in 1887 he married. For a time he conducted a workman's paper, the *Labour World*. He died in 1906.

Davos, a valley of East Grisons, 16 miles S.E. of Chur, has become a fashionable health resort. The village of Davos-Platz is 5,105 feet above sea level, and its still dry air and sunshine make it very favourable for diseases of the chest. It now abounds in doctors, hotels, and tourists, and consumptive patients frequently winter there. The 3,500 native inhabitants are chiefly German Protestants.

Davoust (or DAVOUT), LOUIS NICOLAS, Duke of Auerstädt, Prince of Eckmühl, marshal and peer of France (1770-1823), was born at Annoux. In 1785 he entered the Ecole Militaire, and was appointed sous-lieutenant of cavalry in 1788. In 1792 he distinguished himself at Jemappes, and in 1793 at Neerwinden. In the same year he became adjutant-general, but was deprived of office as an ex-noble. He was restored after the 9th Thermidor, and served at the siege of Luxembourg; and in 1795 he was with the Army of the Rhine under Pichegru. He was taken prisoner but soon exchanged, and in 1797 distinguished himself at the passage of the Rhine. He took part in the Italian campaign, and was much attached to Napoleon. He was in Egypt, where he was again captured and exchanged. After having the chief command of cavalry in Italy, Napoleon in 1804 made him marshal, grand cross of the Legion of Honour, and colonel-general of his Guard. In 1805 he fought bravely at Austerlitz, and his conduct at Auerstädt in 1806 won him a dukedom. He played an important part in the battle of Eckmühl and at that of Wagram in 1809. In 1812 he was defeated in the retreat from Moscow. In 1813 he was besieged in Hamburg. In 1815 he was Minister for War, and in this capacity signed a convention with Blucher and Wellington, undertaking to withdraw the army beyond the Loire. Seeing that the cause of the Empire was irretrievably lost, he gave in his adherence to Louis XVIII., and used his influence to cause the army to follow his example. The king in recognition of this gave him Court employment. He was a brave and brilliant soldier and a stern disciplinarian, who, perhaps, sometimes carried his love of discipline into the region of cruelty.

Davy, SIR HUMPHRY (1778-1829), a great English chemist, born at Penzance in Cornwall. After a severe life at school, he was apprenticed to a surgeon-apothecary. He had already, while at school, developed a taste for chemistry, and had made some experiments on the air in sea-weed. This attracted the notice of, among others, a Dr. Beddoes, of Bristol, who gave him the post of laboratory assistant. His discovery and publication of the properties of nitrous oxide led to his appointment at the age of 22 as Professor of Chemistry to the Royal Institution. In 1830 he became a member of the Royal Society. Here, besides giving a course of valuable and interesting lectures, he made discoveries in galvanism, and made known the properties of chlorine. In 1810 he received the prize of the French Institution, of which he was appointed corresponding member, and in 1812 he was knighted. In 1813 he published *Elements of Agricultural Chemistry*, and was appointed Professor of Chemistry to the Board of Agriculture, and lectured on the subject. His discovery of the safety lamp, of which he made a present to mankind, marked an era in mining. In 1818 he visited Italy and tried unsuccessfully to unroll the Herculaneum MSS. In 1820 he was President of the Royal Society. In 1824 he made an expedition to Norway, during which he hit upon a method—which, however, did not find a practical success—for preserving the copper of ships' bottoms. He died at Geneva, and the authorities gave him a public funeral. A statue of him was erected at Penzance.

Davy Lamp, a device named after Sir Humphry Davy, the inventor, that partially eliminates the danger of introducing a burning candle or oil-lamp into an atmosphere charged with combustible gas. Such an arrangement is desirable in coal mines, where fire-damp is liable to accumulate, and to explode on the introduction of an open burner. Davy's device is to surround the burner with wire gauze, the meshes being sufficiently close to prevent the passage of the flaming gas inside to the combustible gas outside; the gauze is a sufficiently good conductor of heat to prevent much local increase of its intensity, and of course permits the supply of oxygen necessary for combustion of the flame. Recently the electric incandescent lamp has been introduced in place of the old Davy lamp. In this case complete isolation of the white-hot filament is essential for its existence, so it may be entirely screened from the surrounding inflammable gas.

Dawalla (*Hypophthalmus dawalla*), a Siluroid food-fish from Guiana. The genus includes three other species, all from tropical America. There are six barbels, and the eye is behind and below the angle of the mouth.

Dawari, an Afghân tribe, who give their name to the Dawari Valley between lat. 32° 57' and 33° 7' N. There are two main divisions: Tapizae, including the Haidar, Khel, and Idak; and Mâlai, including the Darpa, Amzani, Sô-o. and Mâlakli, with total population about 20,000.

Dawasir, one of the great Bedouin tribes of Central Arabia, who are chiefly located in the valley of like name between Nejd and Asir. They have never been visited by any European traveller, but are reported to be a lawless, predatory people, ostrich hunters, and of fine physique, very tall, and of dark almost black complexion. Some have migrated to Irák-Arabi at the head of the Persian Gulf, where the district of Dawasir, on the left bank of the Shatt-el-Arab, is named from them.

Dawkins, WILLIAM BOYD, born 1838 at Battington, Montgomeryshire, was educated at Rossall and at Jesus College, Oxford. In 1862 he was appointed upon the Geological Survey, and in 1869 became Curator of the Manchester Museum and Professor of Geology in 1874. In 1882 he was made Honorary Fellow of Jesus College and a Fellow of the Royal Society, to which he has furnished many interesting and valuable papers. He has written much on Caves and on Early Man.

Dawson, SIR JOHN WILLIAM, a geologist and naturalist, born in 1820 at Pictou, Nova Scotia. He studied at Edinburgh, and then devoted himself to the natural history and geology of Nova Scotia and New Brunswick. In 1842 and 1852 he aided Sir Charles Lyell in his researches in Nova Scotia. He became Vice-Chancellor of the McGill University, Montreal, and in 1882 received the medal of the London Geological Society. He was knighted in 1884. Besides discovering the *Eozoon Canadense*, said to be the lowest form of organic life, he wrote *The Story of the Earth and Man*, *Fossil Man*, and several other works. He died in 1899.

Dawsonia are the small egg, or bell-shaped, or conical bodies found associated with the Graptolites (q.v.). They are supposed to be the "gonangia," or egg capsules, but until one is found in actual connection with a graptolite, this view cannot be regarded as final.

Dax (for *Dax*), a town in the French town of Landes, on the left bank of the Garonne, was a Roman station, and is now a modern suburb. It is situated on the river, and is joined to the town of Sablon by a bridge. There is a castle, a church, and a bishop's palace. The town possesses many thermal springs.

Day, in astronomy, is the length of time between successive passages of our sun across any meridian. Inasmuch as we are travelling in an ellipse round the sun, our speed being greatest in winter when we are nearest the sun, the length of the solar day varies throughout the year. It is longest in winter and shortest in summer, but is always greater than the sidereal day on account of the earth's rotation round the sun being in the same sense as its rotation about its own axis. In ordinary usages solar time is desirable, for the use of sidereal time would involve such difficulties as that of 12 o'clock sidereal midday happening at 12 o'clock solar midnight. Thus we are compelled to use solar time; and since the solar day varies throughout the year, a *mean solar day* or average for the whole circuit is taken and subdivided into hours, minutes, and seconds. Such a day is about four minutes longer than the sidereal day. The duration of light and darkness in a day depends on the latitude and on the season. If we regard the day as the length of time that the sun is above the horizon, we may say that at the poles the days and nights are each of six months' duration. If the sun is vertically above the equator, as it is during the equinoxes (q.v.), the days and nights are of equal length; if the sun is north of the equator, as in our summer, the days in the northern hemisphere are longer than the nights, and *vice versa*.

Day, JOHN, a sixteenth-century dramatist, who is mentioned as living in 1598, and is also mentioned by Ben Jonson. Of his known works are the *Blind Beggar of Bednal Green*, *Humour out of Breath*, and the *Parliament of Bees*, which is commended by Charles Lamb.

Day, THOMAS (1748-1789), born in London, where his father was a collector of customs. He was educated at Charterhouse and Oxford, and inheriting a small fortune, he was called to the bar, and travelled on the Continent. He appears to have been impressed by the principles of Rousseau, and to have had a certain eccentric turn of mind thereby increased. He had two foundling girls educated, with the idea of marrying one of them, but the marriage did not take place, and he gave each a portion and married them to tradesmen. In 1778 he married a Miss Milnes. He was killed by a fall from a young horse, which he was trying to break in upon a system of his own. He is chiefly remembered as the author of *Sandford and Merton*, a book which has interested and amused many generations of boys.

Dayaks (DYAKS), the aboriginal and uncivilised inhabitants of Borneo, as distinguished from the civilised Mohammedan Malays settled on the coastlands. The name, probably connected with a root *daha*, "man," "people," has, as used by the Malays, the general meaning of "wild" or "savage," but is unknown to the natives themselves, who have no collective ethnical designation, each tribe or family group taking the name of the district or river valley occupied by it, or else of some noted chief living or dead. They are quite distinct both in appearance and speech from the Malays, the features and articulations being more delicate, the

expression more pleasant, the nose larger and more regular, the forehead higher, the complexion lighter, the physiognomy almost European, so that they must be grouped with the Battas of Sumatra, the Mentawey Islanders, the Bisayas of the Philippines, and many others in the Indonesian division of the Malayan populations. [INDONESIANS.] This applies, however, only to the pure Dayaks of the interior, who have hitherto preserved the racial type and customs intact, whereas the coast tribes have already been greatly modified by long contact with the intending Malays. Baron von Kassel, who resided several years in Borneo (1846-49), distinguishes five main groups:—1. The *Pari* of the east and north-east, who wear enormous copper ear-plugs distending the lobe down to the shoulders; 2. The *Biyaju* of the south and south-east, who tattoo the whole body; 3. The south-western tribes named from the districts occupied by them (Sambas, Landak, Sadong, Sarayak, and Sekayam); 4. The *Malayu-Dayaks* of the north-west, long associated with and partly assimilated to the Malays of Sarawak and Brunei; 5. The nomads of the interior, three groups, the *Ott* or *Vutt*, *Puna*, and *Kanketta*, all speaking the same language, all tattooed over the whole body except the face, all noted head-hunters, and apparently cannibals. Till recently head-hunting was practised even by the coast tribes, and gave rise to a chronic state of warfare between all the Dayak populations; but since the spread of British influence it has fallen into abeyance throughout the northern districts, where the natives have become more settled, occupying themselves with agriculture, mining, and several industries, such as weaving, forging, and pottery. (See O. von Kassel, *Ueber die Volksstämme Borneo's* in *Zeitschrift für allgemeine Erdkunde*, 1857; A. R. Wallace, *The Malay Archipelago*; Reports of the British North Borneo Company, 1887-92.)

Dayton, the capital of Montgomery county, Ohio, U.S. America, 66 miles S.W. of Columbus, and at the junction of the Mad and the Miami rivers. It is an important and active industrial city, and is a centre of railway communication. It is well built, and has a court-house formed upon the model of the Parthenon. Its products are beer, cotton, oil, paper, machines and agricultural implements, and wool.

Deacon, in the Greek, Roman Catholic, and Anglican churches, the lowest of the three great orders of the clergy. (The two former churches, however, recognise an order of sub-deacons and minor orders.) It is related in Acts vi. that the Apostles, finding that the ministration of temporal relief to the poorer members of the church interfered unduly with their spiritual work, appointed seven deacons (Greek *diakōnos*, helper) to attend to the former work. Philip and Stephen, the first martyrs, were among the members; but both also preach, and one administers the rite of baptism; in St. Paul's Epistles deacons are referred to as part of the Christian ministry, and in the first three centuries of the church's history the spiritual side of the deacon's work seems to have displaced the

temporal. References to the office by the Fathers seem to indicate this, though there is much controversy as to their precise significance. The Council of Nicæa (325 A.D.) made a marked distinction between deacons and priests, and ordered that the former should be subject to the latter. In the English Church the diaconate is a first step to the ministry, the deacon being usually ordained priest after a year. Occasionally, however (though usually from conscientious scruples), men remain deacons throughout life, as also do sometimes in the Roman Catholic Church those whose work in life is secular rather than sacerdotal (*e.g.* those employed in some political capacity by the Vatican). The idea of an "Order of Deacons," who should not proceed to priest's orders, consisting of missionary clergy less highly educated than the ordinary Anglican clergy and nearer the type of the "evangelist" or "Scripture reader," has been occasionally put forward in the Anglican communion of late years, but not as yet with any definite result. Most of the Nonconformist churches in English-speaking countries holding that a broad distinction was meant by the Apostles to exist between priests and deacons, employ the latter as secular officers, who manage the temporal affairs of the church and occasionally preach, especially in rural districts and at the less formal religious meetings.

Deaconess, in the Primitive Church, was an elderly woman chosen to assist persons of her own sex at baptism, and apparently admitted to the office with some kind of religious ceremony. The office disappeared in the Western Church before the fifth century, though it continued till the twelfth in the Eastern. In 1836, however, Pastor Fliedner established a religious order of trained nurses at Kaiserwerth on the Rhine, which took the name, and many similar orders now exist in Protestant churches. The best known in England are perhaps the "Mildmay Deaconesses," whose headquarters are in North London. In the Anglican Church, however, sisterhoods bearing more resemblance to the Roman Catholic orders are more common. The Church of Scotland has formally recognised the office of deaconess.

Dead, **BOOK OF THE**, an ancient Egyptian work, in 106 chapters, describing in mystical language the adventures of the soul after death, and the texts it must quote to escape the torments of the lower world. Its nucleus was seemingly a collection of moral maxims, like the Proverbs of Solomon (a very ancient Egyptian work, known, from its discoverer, as the "Papyrus Prisse," is a similar collection), and is older than 3500 B.C.; but it contains many later additions (mostly glosses) of a mystical character, some as late as the Persian conquest. It seems to have grown with the myth of Osiris (q.v.). A critical recension has been undertaken by M. Naville.

Dead Beat means the property of a mechanical recorder by which it registers the required reading at once, without tedious oscillations of the needle or pointer. Dead-beat instruments are very

In Great Britain the proportion of the deaf, of all ages, to the whole population, is believed to be about 1 in 1,800. But the number has never been satisfactorily ascertained, for the means employed are not adequate, the information desired is not available, and parents are sometimes unwilling and

sometimes unable to report the facts required to the official persons making the inquiry. The first census of the deaf and dumb taken in this country was in 1851; and at successive intervals of ten years the inquiry has been repeated. The number of deaf mutes at school in the public institutions of Great Britain in 1900 was, as nearly as could be ascertained, as follows:—

	Total.	Boarders.	Day Scholars.
England and Wales .	2,794	1,784	1,060
Scotland	557	465	92
Ireland	522	522	None.
United Kingdom . .	3,873	2,771	1,152

CENSUS RETURN.

	Total Population.	Deaf and Dumb.	Proportion of Deaf to whole Population.
1851 . . .	27,511,801	17,300	1 in 1,590
1861 . . .	29,821,288	20,311	1 in 1,482
1871 . . .	31,845,379	19,237	1 in 1,644
1881 . . .	35,023,639	19,518	1 in 1,794
1891 (Engl'd and Wales)	29,002,525	14,192	1 in 2,048
1901 (Engl'd and Wales)	32,078,315	15,246	1 in 2,143

There are about 70 institutions and schools throughout the United Kingdom. Under powers conferred by the Elementary Education (Deaf and Dumb) Children Act of 1893, the local education authorities of Stoke-on-Trent, Leeds, Bristol and London maintain residential schools out of the rates.

The education of the deaf is only about one century old. We read of isolated attempts being made before the 18th century, in different countries, to instruct one or two deaf and dumb persons, but no concerted efforts are read of until the times of the Abbé de l'Epée in France, and his contemporary Samuel Heinicke in Germany. As a rule, the isolated efforts above referred to were looked upon as miracles, and died out, as all eight days' wonders do. In Spain Pedro Ponce (1520-84), a Benedictine monk, taught deaf mutes to speak, and in the following century another monk belonging to the same order, Juan Paulo Bonet, published a work on the subject, which has been translated into many languages, in which he gave an account of his experience as a teacher. His book contained a manual alphabet. It was published in 1620, and served as a guide to the Abbé de l'Epée, nearly 150 years later. Bonet, however, advocated oral teaching. De l'Epée was the first to use artificial signs and the manual alphabet as a means of com-

munication and for conveying knowledge, and thus gave the manual alphabet and signs the character of a language. Bonet's fame spread, and his work was taken up by our countrymen. In 1648 Dr. John Bulwer published his *Philocophus, or the Deaf and Dumb Man's Friend*, in which he speaks of a lip grammar which "may enable you to hear with your eye, and thus learn to speak with your tongue." Dr. William Holder published his *Elements of Speech, with an Appendix concerning persons deaf and dumb*, in 1669; and Dr. John Wallis, Professor of Mathematics in the University of Oxford, taught some deaf and dumb pupils with great success, and corresponded largely on the subject with his contemporary, Dr. John Conrad Amman, a physician of Haarlem, who published many valuable books, of which *Surdus Loquens* ranks foremost (1692). This small book, translated into many languages, is still of service to the teacher. Amman was a physician practising at Haarlem, where he successfully taught the daughter of one of his patients, and so great is his merit that in Holland, to the present day, the oral system is often called the Amman System. George Dalgarno, the author of *The Deaf and Dumb Man's Tutor*, which was published in 1680, and which is another book worthy of mention, is the probable inventor of the two-handed alphabet in use in our English institutions. It was not, however, until 1765 that the Abbé de l'Epée made the instruction of the deaf a special branch of work by collecting a few deaf children and opening the first school. Samuel Heinicke did the same in Germany; and the first school in the United Kingdom was started by Thomas Braidwood at Leith, near Edinburgh. Braidwood removed to Hackney in 1783, and his nephew and assistant, Dr. Joseph Watson, became the head-master of the London Asylum, opened in 1792. As soon as the fact was ascertained, without a doubt, that deaf and so-called dumb children could, by means of instruction, be rendered useful members of society and industrious, respectable citizens, British philanthropy came to the fore, and we can now boast of having a large number of institutions and schools for the education of the deaf in every part of the kingdom. What State aid has accomplished in other countries, Great Britain has done by its own philanthropy. It is now, however, no longer an exception to other nations where State contributions step in to help private efforts to make the education and instruction of the deaf as complete as possible. Since 1893 the Government has contributed five guineas per head for every deaf child in certified schools—viz. three guineas for general instruction and two guineas for technical instruction. The systems followed in Great Britain until 1867 were the French System and the Combined System, excepting in a very few cases where private persons had their children taught by private tutors. It was not until 1867, as just mentioned, that, at the instance of the late Baroness Mayer de Rothschild and her friends, the Pure Oral System was introduced into Great Britain. The Baroness founded a Home in London for poor Jewish deaf mutes, and having heard of the results of the oral system abroad, resolved upon securing for her protégés the most

improved instruction she could obtain. This was the means of bringing to England Mr. William Van Praagh of the Rotterdam school to undertake the work. The success which attended the Pure Oral System was so marked that the late Baroness and her friends resolved to extend its advantages to the community at large, and as a result she, with the co-operation of a very influential committee, founded the Association for the Oral Instruction of the Deaf and Dumb in 1870, and the Normal School, and Day Training College for Teachers of the Association were opened on the 15th July, 1872, under the directorship of Mr. Van Praagh. In 1877 the success of the work of the Association led to the formation of a somewhat similar society by Mr. St. John Ackers with a Residential Training College at Ealing.

The spread and adoption of the Pure Oral System since 1867 has been most marvellous. Originally limited to Germany and Holland, it has spread rapidly through Italy, has become the Government system of France, and has been introduced in many parts of America, where only recently Dr. Graham Bell, of telephone renown, has established a society for the encouragement of teaching speech in schools for the deaf. The International Conferences at Paris, and particularly the one at Milan in 1880 and the last one at Brussels in 1883, have most fully established the superiority of the Pure Oral System on the Continent. English teachers have held conferences also, which have tended to encourage the adoption of the Pure Oral System. It was crowned with almost unanimous approval at Milan, and was immediately adopted in other places. In 1886 a Royal Commission, under the presidency of Lord Egerton of Tatton, was appointed to inquire into the education of the blind and the deaf and dumb. Its report is most exhaustive and complete, and the two "recommendations" which it made are—

No. 9 recommends "that every deaf child should have full opportunity of learning the Pure Oral System. In the case of children who receive Government grants, whether for the deaf or for the blind, Manual, or other instruction, the children should be, for the purpose of instruction on the Oral System, separated from those who are to be taught by other means. In the Pure Oral System, unless a child is physically or mentally disqualified, no child should be removed from the Oral department of a school, or be taught elsewhere, without the consent of the parent."

The parent should be given the liberty of choice. The child should be given the opportunity of learning the Oral System exclusively, and the parent should be allowed to choose. And, although the Oral System is the only system in Britain in

all our schools, one scarcely finds a single school now in which articulation is not introduced and carried on to some extent. The Pure Oral System uses the eye as a substitute for the ear, and lip-reading is the very "backbone of the system." It is of the greatest importance that a deaf child should be made to understand even before it can speak, just as hearing children understand before they can articulate. Every sound which we emit produces vibration of the face and throat, as well as of the lips. Sight and touch are therefore used to teach the deaf child to reproduce sound. The child is taught gradually and successively to inhale and exhale, to emit vowel sounds, to combine the vowel sounds with consonants, and the combined sounds into words. The meanings of these words are illustrated by objects or pictures. Instruction of the deaf consists in the teaching of articulation and the teaching of language together. They continually go hand in hand. The deaf and so-called dumb children are taught to speak, lip-read, to read and write, simultaneously.

When a teacher pronounces a sound the child imitates it—that is, he *speaks*; he is taught to recognise it when spoken—he *lip-reads*; he is taught the sound in letters—he *reads*; and imitates them on the blackboard, the slate, or paper—he *writes*. The *modes* of teaching on the Pure Oral System may differ sometimes in detail, but the *principles* are always the same. They vary according to locality, length of the course of instruction, and from other causes. The principles are—that from the very outset lip-reading and articulate speech must be the sole and exclusive means of conveying language to the child; that every effort must be made to make lip-reading as perfect as possible; that no other means of conveying language to him are to be allowed—no signs whatever, except the so-called natural signs in the earliest stages, and not much writing. Speech must become to deaf children what it is to hearing children—it must be part of their existence; and lip-reading must be practised to such an extent that it becomes a natural process equivalent to hearing. Every deaf child, before going to school, has a command of natural signs, which must not be extended beyond pointing, and must never on any account degenerate into *artificial* signs.

Natural signs are easily distinguished from artificial ones; natural signs being understood by everyone, artificial ones only by the initiated. The French System makes use of the natural signs of the deaf, but develops the natural ones into artificial ones, and uses them and the manual alphabet as means of instruction. The Combined System uses both manual alphabet and speech, as well as signs; but specialists are of opinion that the French System—teaching by signs—is even preferable to a Combined System. A Pure Oral teacher looks upon signs as weeds in his garden, and uses every means to encourage spoken language exclusively. The Pure Oral System he upholds as preferable because (1) it emancipates the deaf mute by giving him the great gift of speech; (2) because it develops the power of understanding what others say; (3) because it teaches language in the natural way;

(4) because it extends his means of acquiring knowledge, since everyone whom he sees talking and who converses with him becomes to him a teacher, whilst at the same time it destroys the isolation of his life, and makes him better fitted to mix in general society.

The education of deaf mutes is carried out in boarding schools and in day schools. Each of these systems has its ardent partisans who vigorously defend their own cause. Those in favour of Boarding Schools say that deaf children want constant supervision; the friends of the Day School System maintain, on the other hand, that their pupils have a larger field of observation, and derive much benefit from daily mixing with the outer world.

Deaf boys and girls, after having finished their school education, are apprenticed to suitable trades, like hearing boys and girls. The kind of occupation for which a deaf boy is fitted depends, to a great extent, upon the class of family to which he belongs; yet care must be taken not to apprentice him to anything that is subject to change of fashion, but to an industry of some permanent character.

Separate and independent societies exist throughout the country to look after the spiritual and temporal welfare of the ADULT deaf and dumb. The headquarters of these organisations for London are the offices of the Royal Association in Aid of the Deaf and Dumb, St. Saviour's, 419, Oxford Street, where all information on the French or Manual System may be obtained. There are two Colleges for the Training of Teachers of the Deaf and Dumb on the Pure Oral System—a Day Training College at 11, Fitzroy Square (opened 1872), and a Residential Training College at Ealing (opened 1878)—besides which there exists an Examining College of Teachers (offices, 419, Oxford Street, W.), (opened 1886), which gives certificates to teachers of all systems. In 1907 these three colleges amalgamated for examination purposes, forming the Joint Board of Examination, and thereby securing one standard of qualification for Certificated Teachers of the Deaf throughout the United Kingdom.

Information on these subjects, with lists of publications, etc., may be obtained from the Association for the Oral Instruction of the Deaf and Dumb, 11, Fitzroy Square, London, W.

Deaf and Dumb, LEGAL RIGHTS OF. A deaf and dumb person cannot serve as a jurymen, nor can he serve in the army or navy. If he has received a good education, and knows the importance of an oath, his evidence as a witness is admissible, either by signs, through an interpreter, by writing, or by spoken words. Both in England and Scotland they may make wills; and an instance is on record (May, 1861) in which a will was made by a lady born deaf who became blind also at the age of sixty, and whose will, made at seventy years of age, when contested and challenged, was conclusively proved and established in the Court of Probate at Westminster. A strange case occurred recently in one of the minor courts in Scotland where the defendant, being deaf and not answering to his name simply from not hearing it, though he was present,

was considered to have treated the Court with contempt by his absence, and the verdict was given against him.

Deafness. [EAR.]

Deák, FRANCIS (1803–1876), a Hungarian politician, born at Kehida, in Szalad, of a very ancient noble Magyar family. He studied law at Raab, which town he represented in the Diet of 1832. By his firmness and inflexibility of principle, conjoined to great amenity of manner and the faculty of yielding upon secondary points that did not involve essential principles, he became the chief instrument in reconciling the Hungarian kingdom with the Hapsburg dynasty. In 1848 he was Minister of Justice in the Ministry of Count Batthyany, but on the access to power of the more advanced party he retired into private life. In the same year he had been chosen to draw up an address applying for a Constitution, and, though the application proved unsuccessful, the Emperor sent for him to consult as to what Hungary really required. In 1861 he represented Pesth in the Diet. After the war of 1866 a demand was again made for a Constitution, and Deák's moderation in demanding only what had been asked for before caused it to be successful. He died at Buda-Pesth.

Deal, a municipal borough and watering-place on the E. coast of Kent. Though not one of the original Cinque Ports, it became a "limb" of them and shares their privileges, being a corporate member of Sandwich. Between the N. and S. Forelands, it is 89 miles from London and 6 S.E. of Sandwich, to which parliamentary borough it formerly belonged. The industries of Deal took their rise in the fitness of its situation for supplying the wants of vessels lying in the Downs between the coast and the Goodwin Sands. The Deal boatmen, called "hovellers," are renowned for their fearless daring in carrying aid to ships in distress. Of three castles built by Henry VIII. for the protection of the coast, one—Sandown—has been demolished; another—Walmer—2 miles S., is now the official residence of the Lord Warden of the Cinque Ports; and Deal Castle is the residence of the Captain. There is a fine beach, and an iron pier was built in 1864. Perkin Warbeck landed here in 1495. (Pop. 1901, 10,575.)

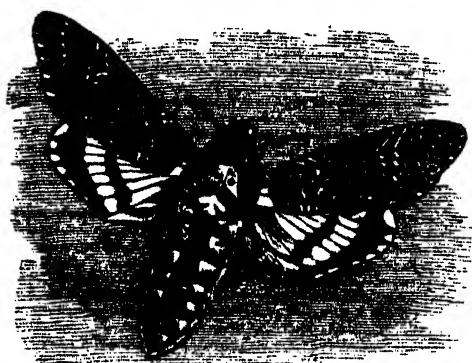
Deal Fish (*Trachypterus arcticus*), a North Atlantic deep-sea fish of the Acanthopterygian family Trachypteridae, containing the Ribbon-fish (q.v.). The body, which in large specimens may be six feet long and a foot high, is very thin and brittle; colour, silvery-white; dorsal and caudal fins red.

Dean (Lat. *decanus*, from *decem*, ten), originally the head of a body of ten. Thus in early England the tithings, or subdivisions of the hundred for the administration of justice, had each its dean. Similarly the bishops divided their dioceses into groups of ten parishes, over each of which there was a dean (called in the towns, dean of the town, and in the country, rural deans). Again, in monasteries and collegiate and cathedral foundations, deans were appointed to see after the internal discipline. At present the colleges at Oxford and

Death Rate. It is usual to state the number of deaths (or births) occurring in any district as being so many per 1,000 per annum. If the death-rate is calculated for a period less than a year, the deaths are still estimated at so many per annum, the figures given being arrived at on the assumption that deaths continue to occur for a whole year at the same rate as they occur during the observed period. Thus a weekly death-rate of 21 in London means that if people died during one year at the rate at which they die in the week under consideration, then in every 1,000 persons there would be 21 deaths. Two main corrections may be applied to the gross death-rate—viz. the correction for non-residents (those dying within the district who do not belong to it should be excluded from the return, while those belonging to the district who die outside it should be included);

again, there is the correction for age and sex distribution, for the liability to death differs in the two sexes, and there are marked divergences in death-rates at different periods of life.

Death's Head Moth (*Acherontia atropos*, Linn.) is the largest of the British butterflies or moths (Lepidoptera), and has an expanse of wing of about six inches. The general colour is dark brown, but the hinder pair are ornamented with black bands. There is a white patch on the thorax, with a couple of dark dots upon it: from the



DEATH'S HEAD MOTH. (*Acherontia atropos*.)

supposed resemblance of this to a skull the moth has derived its popular name and the legends associated with it. Popular interest in the moth is also aroused by the fact that it is one of the few members of that group that can make a noise: when frightened it can emit a distinct squeak. It is more common than usually supposed, but, as it only flies at night, escapes observation. Potatoes and the deadly nightshade (*Atropa*, whence its specific name) are its favourite food, and its larva is frequently found in the Kent potato-fields.

Deathwatch, a small beetle, about a sixth of an inch in length, that lives in old wood, and is in the habit of striking its head against the walls of its burrow: it thus makes a slight ticking noise, from which it has derived its popular name. Its name is *Anobrium domesticum*.

De Bary, HEINRICH ANTON (1831-1888), a German botanist born at Frankfort-on-Main. Educated at Heidelberg and Berlin, he began in 1853 to practise as a doctor at Frankfort, but the next year became a *privat docent*, or University lecturer, at Tübingen. In 1855 he was appointed Professor of Botany at Freiburg, and in 1867 he went to Halle. In 1872 he became rector of the University of Strasburg, where he remained till his death. He was an authority upon fungi, and his *Lectures on Bacteria, Morphology of Plants*, and *Comparative Anatomy of Phanerogams and Ferns* have been translated into English.

Debenture Stock is part of the capital stock of a railway or other company which is lent out on mortgage and secured on a specified part of its property. The deed assigning this property as security is called a debenture (Latin *debeo*, I owe). Frequently, for convenience of transfer, the debenture stock is represented by a number of debentures, each of relatively small amount (commonly

£100). By the Companies' Clauses Acts, 1862, debenture holders who do not receive their interest have power to require the appointment of a receiver (q.v.).

Debit. [BOOK-KEEPING.]

Debreczyn, a Hungarian town on a plain 130 miles east of Pesth, the largest and most populous town after Pesth, but having rather the appearance of an immense village, the town proper being separated from the suburbs by a palisade. There are some fine buildings, among them being the Protestant college, which has a good library. It is the great headquarters of the Protestants of the country, and the greater part of its population are Magyar Protestants. In the neighbourhood large herds of cattle are reared, and there is a good trade in cattle and grain. There are also manufactures of soap, saltpetre, sausages, hams, and tobacco pipes. At the revolution of 1849 the National Diet took refuge here after the capture of Pesth.

Debt, a legal obligation to pay money, arising out of a contract, express or implied. In general, whenever a contract is such as to give one of the parties a right to receive a liquidated sum of money from another, as in the case of a bond for the payment of money, or an implied promise to pay for goods supplied so much as they shall be reasonably worth—a debt then exists between these parties; while if the demand be of wholly uncertain amount (as, say, for *damages* arising from negligence or otherwise) it is described not as a *debt*, but as a claim for *damages*. As debts may thus arise from contracts, and the contracts may be either specialty contracts or simple contracts, so the debts resulting therefrom are termed either *specialty debts* or *simple contract debts*. Debts may, however, arise not only by deed or simple contract, but by matter of record, and in that case they receive the appellation of judgment debts or *debts of record*. A debt of record is a sum of money appearing to be due upon the evidence of a court of record; thus it may be due upon a *statute merchant* or *statute staple*, or upon a *recognisance*, which latter is an obligation of record, entered into before some court or magistrate duly authorised, whereby the party bound (the recognisor) acknowledges his debt to the Crown or to a private person (the recognisee) as the case may be, to be void if he shall do some particular act—as if he shall appear at the assizes, keep the peace, pay a certain debt, or the like. Judgment debts are also, as already mentioned, debts of record, for when any sum is, in any action in any court of record, adjudged to be due from one party to another, whether that sum was originally liquidated so as to constitute a *debt* between them, or was fixed and ascertained for the first time by the verdict of a judge or jury, the claim having been originally in the nature of *damages*, that is a judgment debt, and a debt of record. Debts may also arise other than from contracts and judgments, as where an Act of Parliament affixes a penalty to some particular offence which is made recoverable by an informer; any one committing such offence becomes indebted

in the amount of the penalty to the informer, so soon as the information is laid. Also anyone who has never contracted at all to pay a rent charge issuing out of land may become liable therefor as for a debt, and that merely by reason of his having taken and enjoyed the land out of which the rent charge issues. And practically there is a contract implied by law in all such cases of liability. Debts may be attached. [ATTACHMENT.] Debts are now assignable at law so as to enable the assignee to sue for them in his own name, but express notice must be given to the debtor, trustee, or other person from whom the assignor would be entitled to claim such debt; formerly he could only sue in the name of the debtee. Debts are further distinguished as *secured* and *unsecured*. By the Judicature Act, 1873, it is provided that in the administration of an insolvent estate of a deceased person and in the winding up of an insolvent company the same rule shall prevail as to the rights of secured and unsecured creditors, and as to debts and liabilities provable, and as to the valuation of annuities and future and contingent liabilities respectively as may be in force for the time being under the law of bankruptcy with respect to the estates of persons adjudged bankrupt. [BANKRUPTCY.]

Débüt (French), a first appearance before the public, commonly used of actors. A *débutante* in London society is a young lady who has just "come out," i.e. has been, or is shortly to be presented to the Sovereign at a Drawing-Room (q.v.).

Decagon, a closed figure whose sides are ten straight lines. If the sides are all equal and the angles between consecutive sides equal also, we have the regular decagon.

Decalog, the Ten Commandments (statement), the Ten Commandments.

Decamer, lasting ten days, as *dechāmerus*, supposed to be a country house during the time of the Decameron, written by Boccaccio (q.v.).

Decamp, to flee, to run away, (1803-1860), a French painter, an early age he was sent to the Academy of Picardy, and here—his biography—he forgot his name—nesting and or "grain of" that "grain of" He studied in a studio gained in influence. He did much in 1822 he spent a summer in the south. He then produced many works which are now in the *Firman*. He was a political caricaturist imitating the style of the *Caricature*, produced in 1822. He was on the side of Delacroix's. In 1839 he was

made chevalier, and in 1851 officer of the Legion of Honour. He was killed in a hunting accident at Fontainebleau. He was a great colourist, and a good manager of light and shade, and had a quick method of working, his idea being at once formed and flowing as it were from his brush. "Manu promptus" one of his critics has said of him.

De Candolle, the name of four generations of botanists, the first of whom was AUGUSTIN PYRAMUS DE CANDOLLE, who was of Provençal descent, and was born at Geneva in 1778. He studied at Geneva, where Vaucher directed his attention to botany, and at Paris, where he gained the friendship of Jussieu, Cuvier, Biot, and Lamarck, and graduated as M.D. in 1804. In 1799 he published *Historia Plantarum Succulentarum*, and between 1803 and 1815 the third edition of the *Flore Française*, in the introduction to which he set out his natural system of classification. In 1807 he was appointed professor of botany at Montpellier, and in 1816 at Geneva, a post he retained till, in 1834, he was succeeded by his son Alphonse. From 1824 he devoted himself to the great exposition of his system in a *Species Plantarum* entitled *Prodromus systematis regni vegetabilis*, of which he executed seven volumes, the completion having only recently been accomplished by his son and grandsons. He also laid the foundations of one of the largest herbaria in the world. He died at Turin in 1841. Augustin de Candolle shares with the Jussieus the honour of establishing the natural system in place of the artificial system of Linnæus.

Decantation, an operation in which a solid substance is separated from a liquid in which it is suspended, by allowing the solid to subside—pouring off the liquid—refilling with water or other liquid—and repeating the process several times.

Decapoda, the name of two orders of Invertebrates—one of Crustacea and the other of Cephalopoda. (1) The former is the better known of the two sub-orders of the Podophthalmata or "Stalked-eyed Crustacea," and it includes the crabs, lobsters, prawns, and many of the most familiar larger English crustacea. The characters of the order are the fusion of the thoracic somites into a distinct head and the fact that the five last pairs of feet on the thorax are seven-jointed and of but one branch (i.e. are uniramous). It is from these five pairs of similar and approximately equal legs that the class derives its name. The branchiæ or gills are borne on the legs or the sides of the body, and are enclosed in a special cavity. The head and thorax are protected by a strong shield known as the cephalothorax; in the Brachyura the abdomen is turned up under the body, and is therefore also protected by the carapace. The Decapoda differ so much among themselves, and the order includes so many important crustaceans, that further details are given under the sub-headings:—There are two sub-orders, the Macrura or "long-tailed" group and the Brachyura or "short-tailed." The former includes the lobster, crayfish, shrimps, prawns, hermit crabs, tree crabs (*Birgus*), etc. The Brachyura includes the true crabs, the sponge crabs (*Dromia*),

the land crabs (*Gecarcinus*), etc. To each of these reference should be made. (2) Cephalopoda Decapoda, a sub-order of the Dibranchiata or two-gilled Cephalopods. In this group the animals have eight equal arms and two longer arms or tentacles with expanded ends; the function of the latter pair is reproductive. Correlated with the possession of these tentacles are the presence of fins and an internal skeleton and the fact that the suckers on the arms are stalked or "pedunculate." The Decapoda are divided into four families:—The *Belemnitidae* or Belemnites (q.v.), which are all extinct; the *Spirulidae*, containing *Spirula* (q.v.), a small form common in Southern seas, which is provided with a delicate spiral internal shell; the *Egopsidae*, a primitive family, with an eye of which the cornea is perforate; *Ommastrephes* is the best known genus. The last family is the *Myopsidae*, in which the eye is closed; it contains the sub-families *Sepiadae*, with the Cuttle-fish (q.v.), and the *Tenuthidae*, with the Calamaries (q.v.) or Squid as its best known representative.

Decatur, STEPHEN, an American naval officer, was born at Sinnepuxent, Maryland, in 1779, and entered the navy in 1798. He served on the coast of Central America, and afterwards, in 1804, brought himself into notice in the Mediterranean by cutting out an American frigate, the *Philadelphia*, which had been captured and carried into Tripoli. In the war of 1812 he had command as commodore of the frigate *United States*, 44, in which he met, and after a smart action, took the British frigate *Macedonian*, 38. In this exploit he had the advantage of largely superior force. He afterwards commanded the *President*, 44; and in her, after leaving New York harbour, he was chased by a British squadron, and engaged, especially by the *Endymion*, 40, and then by the *Pomone*, whereupon, having lost heavily, he struck. This was early in 1815, and at the very end of the war, at the conclusion of which Decatur, with a squadron, proceeded to the Mediterranean and there executed reprisals against the Dey of Algiers. Upon his return he was appointed Commissioner of the navy. Commodore Barron, whom in 1807 he had superseded, and at whose trial he had subsequently assisted, appealed to him in this capacity for reinstatement in the service. Barron had been found guilty of having surrendered the *Chesapeake*, and Decatur bitterly opposed the reinstatement. A duel was fought on March 22, 1820; both men were wounded, and Decatur died a few days afterwards.

Deccan (from Sanscrit for *south* or *right*, since in turning to the east a worshipper had the south on the right) was a name given before the Mussulman conquest of India to the district S. of the Vindhya Hills, and then to the tract lying between the Nerbudda and the Krishna, from lat. 16° to 23° N. Its large population is of very mixed origin.

Deceased Wife's Sister. By the laws of the United Kingdom, marriage with the sister of a deceased wife was prohibited as being incestuous. After organised agitation for over sixty years, an Act was passed in 1907 legalising the marriage.

December (Lat. *tenth*), the last month of the year. The name is due to the fact that the Roman year began with March, till the reform of the Calendar by Julius Cæsar.

Decembrists, or DEKABRISTS, the participants in the Russian revolutionary outbreak of December 14 (26), 1825. The movement, although suppressed after a bloody scene in St. Petersburg in a single day, was a turning point of modern Russian policy. A secret commission, presided over by the new Czar's younger brother Michael (to whose presence is credited the loyalty of the artillery), condemned five of the leaders—Pestel, the poet Rileyef, Muravief-Apostol, Bestiazhef-Riumen, and Kakhovski—to be hanged; many others were banished. An amnesty on the coronation of Alexander II. liberated some of these exiles, and the memoirs of Baron Rosen and several others have been published in Russian. Almost half the noble houses were implicated in the revolt; few were quite unsympathetic. It had also a markedly democratic character. Since the fall of Napoleon, Alexander, now a convert to the ideas of the Metternich school, had been more and more dominated by reactionaries like Araktscheyef, hated as founder of the military colonies, and orthodox fanatic like Photi. In 1822 freemasonry was suppressed (Colonel Batenkof, one of the Decembrists, had been president of the Siberian lodges), and all but the strictest of religious societies were treated similarly. The censorship and regulation of universities became severer. On the other hand, since the granting of a constitution to Poland (1815), and the long stay of the armies in the West, the desire for reform, constitutional government, and the abolition of serfdom had grown rapidly. The death of Alexander, the mysterious renunciation of Constantine (who had married a Polish Roman Catholic lady), and the succession of Nicolas, gave at last an opportunity for an open demonstration. But many distinguished liberals, like Prince A. A. Suvorof (then in the Guards), would not go to this length; and some, like Prince Wyasemski, more interested in literature and the arts than politics, even continued in office afterwards. The result meant the complete loss of the already limited political power of the noble and cultured class. The successful reactionaries made short work of the remnants of Russian liberalism. Literature and art became mere appendages to court life. The Arsamass, a coterie of poets and writers like Pushkin, Griboiedof, and the Turgeniefs, was suppressed; the power of secret police surveillance was re-established; the famous "Third Division" became the most vital branch of the Government; and all the circumstances arose out of which in the next generation "Nihilism" was born.

Decemviri, or DECEMVIRS (Lat. *ten men*), the name of various committees of ten in ancient Rome. The best known is that elected in 451 B.C. to revise and codify the laws in consequence of the disputes between patricians and plebeians. At the expiry of their year of office a fresh commission was elected, Appius Claudius (q.v.) being the

only member who had served on both. These behaved very tyrannically, and the decision of Appius Claudius in the case of Virginia led to their overthrow. The laws they drew up formed the twelve tables, the most ancient body of Roman laws. Another (permanent) body of decemvirs had the care of the Sibylline books (q.v.).

Deciduous, a term applied to all organs of plants that fall off early. The stamens are generally deciduous, falling off when the pollen is discharged; the petals are so also, falling after pollination; the sepals are so in some cases, as in the cherry, though not so in others, as in the apple, gooseberry, or tomato; the whole of a male inflorescence or catkin (q.v.) often is so after the discharge of the pollen, as in the hazel; and sometimes these branches, when shed, bear one or two foliage-leaves, as in willows. The winter bud-scales or *perulae* are commonly deciduous, as are also the stipules in some cases where they serve the same purpose. Leaves are termed deciduous when they fall before the unfolding of a fresh crop, so that the plant is left with bare boughs. The larch and the deciduous cypress (*Taxodium*) are exceptional among gymnosperms in being deciduous; but among angiosperms it is the rule for the trees and shrubs of the cooler temperate and arctic zones to be so. Some plants are only deciduous when the winter is severe, as in privet. The fall of the leaf (q.v.) has the effect of checking the growth of the plant, and so bringing about the arrangement of wood in annual rings. [EVERGREEN.] Deciduous trees are, though generally rare, common in England; in most countries deciduous trees are the exception.

Decimal Fractions, in arithmetic, a system of expressing fractional portions of unity by means of a series of fractions, the denominators of which are powers of ten. Thus, $\frac{1}{10}$ may be represented as $\frac{1}{10} + \frac{1}{100} + \frac{1}{1000}$, or in the usual abbreviated form .111, the position of each digit after the decimal point denoting the magnitude of the denominator. Thus .111 is $\frac{111}{1000}$. Any number may be expressed in decimal fraction. It sometimes happens that a long series of decimals is required, as in the case of $\frac{1}{3}$, which is .333333, and $\frac{1}{7}$ is .142857, and 3 alternating for .333333, and 142857 for .142857. In certain fractions like the latter, the series of decimals to be exacted is infinite, and each recurrence is signified by a horizontal line over the first and last figures of the series, as .333333, and .142857. The above recurrence is denoted by .333333, and .142857.

Rules for the addition and subtraction of decimals are based on the same principles as those for the addition and subtraction of integers, and need no further explanation. The addition and subtraction of decimals is more readily performed than that of integers; different rules for the multiplication and division of decimals are readily seen.

when they are brought to the forms 3.14285 . . . and 3.14159 . . . respectively. In multiplication of decimal fractions one operation alone is necessary, whereas with vulgar fractions two are requisite. Nevertheless the decimal operations are sometimes more tedious, and as stated above simple ratios frequently require to be expressed as complex decimals.

Decimal System, a method of expressing weights and measures in units that are in the ratios 1000, 100, 10, 1, $\frac{1}{10}$, $\frac{1}{100}$, and $\frac{1}{1000}$, to each other. In the French or metric system we have, for example, the unit of mass, one *gramme*. From this are derived by repeated tenth-multiplication the *decagramme*, *hectogramme*, and *kilogramme*; and by repeated tenth-division the *decigramme*, *centigramme*, and *milligramme*. Throughout the system the Greek prefixes denote multiples of the unit, and the Latin prefixes denote submultiples thereof. Thus a millimetre is the thousandth part of a metre, the hectometre is a hundred metres, and a decigramme is the tenth of a gramme. [METRIC SYSTEM.]

Decimation (Latin *decimus*, tenth), the killing of every tenth man (usually drawn by lot) in a regiment or military division guilty collectively of some grave offence, e.g. mutiny. The practice is a Roman invention, said to have been revived by Crassus (q.v.) after long discontinuance. Instances are known under the Roman Empire, and it has been occasionally resorted to in modern times.

Decipium, a rare metallic element, the existence of which, in the mineral Samarskite, was indicated in 1878 by Delafontaine.

Decius, CNEIUS MESSIUS QUINTUS TRAJANUS (200-251), a Roman Emperor born in Lower Pannonia. In 249 the mutinous army of Mæsia made him Emperor against his will and forced him to march against Philippus, the then Emperor, whom he defeated and killed near Verona. His reign of two years was chiefly occupied in fighting against the Goths, and he was killed in battle with them owing to the treachery of his successor, Gallus. His home policy was to restore the Rome of former times, and in pursuance of this he began the seventh persecution of the Christians, in the course of which the Bishops of Rome, Antioch, and Jerusalem were killed, and Origen was tortured.

Decken, KARL KLAUS, BARON VON (1833-1865), an African traveller born at Kotzen. He was of good family, and was educated at the Gymnasium of Lüneberg, from which he passed to the Cadets' College of Hanover, and then entered the army as lieutenant of Hussars. Tiring of the army after 10 years he entered upon his career as a traveller, and started for Nyassa. Owing to the treachery of his guide he was obliged to return. In 1861 he went to Kilimanjaro with an Englishman named Thornton, and in 1862 he climbed it to a height of 14,000 feet. In 1864 he came to Europe to organise an expedition to explore the rivers of the east coast of Africa. His steamboats were wrecked, and in 1865 he and his companion, Dr. Linck, were killed by a Sheik

Hamadi, who had done his best all along to prevent the expedition.

Decker, Sir Matthew (1679-1749), a political economist who, born at Amsterdam, came to London in 1702, and prospering as a merchant, obtained a baronetcy and a seat in Parliament. He wrote two treatises—one, in 1743, a consideration of the value of land and of the heavy loads borne by the English nation, especially the commercial part of it, and the other, in 1744, upon British foreign trade. Later economists have questioned the authorship as showing views too advanced for the times. Among his proposals were the abolition of monopolies, the forbidding the exportation of corn, the forbidding of begging, and a scheme for paying off the national debt.

Decks are the planked floors of a ship. In first-rate ships of the line in the days of wooden vessels there were three gun-decks running from stem to stern, these being known as upper or main, middle, and lower. Higher than the upper deck were the forecabin at the forward end, and the quarterdeck abaft the gangway. On these partial decks guns were also carried. The middle portion of the upper deck remained uncovered and was called the waist. Underneath the lower deck was the orlop deck, half below the water-line. The "half deck" is properly the space between the foremost bulkhead of the wardroom or cabin and the "break" of the quarterdeck. As the after-part of the quarterdeck became in course of the development of naval architecture raised above the rest, it obtained the name of "poop."

Declaration, a formal statement or affirmation.

1. In all actions it was the term used for the next step by plaintiff after service of the writ of summons. "A Statement of Claim" is now substituted by the Judicature Acts.

2. *A Declaration of use or trust* is a statement or admission that property is to be held to the use of or in trust for a certain party. If the property be land or chattels real, this must be in writing. A Declaration of trust is the usual mode of creating a trust, where the trust property is already vested in a trustee.

3. A Declaration was substituted for an oath in certain cases by the Statutory Declaration Act, 1835. A statutory declaration may be made before a Justice of the Peace or Commissioners or other officers authorised to administer oaths. Any person wilfully making a false declaration is guilty of a misdemeanor.

4. *Declaration of title*. The Act for obtaining this was passed in the year 1862, and after reciting that it is expedient to enable persons having interest in land to obtain a judicial declaration of their title to the same so as to enable them to make an indefeasible title to persons claiming under them as purchasers for a valuable consideration, it is enacted that every person claiming to be entitled to or to have a power of disposing of, for his own benefit, land (not of copyhold or customary tenure) for an estate of fee simple in possession absolutely or subject to incumbrances, estates, etc., or entitled to apply for the registration of an

indefeasible title under the "Transfer of Land Act," may petition the Court of Chancery, now the Chancery Division of the High Court of Justice, for a Declaration of Title (Judicature Act, 1873).

5. *A Declaration of inability to pay debts*. Such a Declaration when signed and regularly filed constitutes an act of bankruptcy, upon which the debtor may be adjudicated a bankrupt. Under the old law it was termed a Declaration of insolvency. [BANKRUPTCY.]

6. Declaration is the term used in Scotland for a statement made by a prisoner before the magistrate immediately on his being brought before him. The magistrate has the power to postpone this for a period or not more than 48 hours after the arrest to give prisoner time to take legal advice.

7. *A dying Declaration* of persons in extremis, both in England, Scotland, and the United States, verified by accredited witnesses, is, under certain circumstances and under certain restrictions, admitted as evidence. This is, however, an exception to the ordinary rule as to secondary or hearsay evidence.

Declension (Latin *declensio*, falling off), in grammar, the series of modifications of the fundamental meaning of any noun by case-endings expressive of relation. The Greek grammarians treated the nominative as expressing the pure meaning of the word, and the other cases as "fallings off," inasmuch as they express not only the pure meaning but certain relations as well.

Declinate, leaning to one side, a term applied especially to the stamens in the cacti and other flowers.

Declination (1) of a star, in *Astronomy*, is the arc on the star's meridian in the celestial sphere, intercepted between the star and the celestial equator. It is, therefore, the altitude of the star measured from the equator. With this and the right ascension the relative position of the star in the heavens is determined. (2) In *Magnetism*. When a magnetic needle is suspended by a fibre or pivot at its centre it assumes a definite direction by reason of the earth's magnetic force. It lies in a line that is called the magnetic meridian at that spot on the earth's surface, and the more northerly end points to what is called the magnetic north. As a rule the magnetic north at any place will not coincide with the true or geographical north—the magnetic meridian will not be identical with the geographical meridian. The angle between these two directions is called the *declination*. Thus in London the declination is about 17° west of north; it increases up to a certain limit as one travels westwards, subsequently diminishing to zero in the region of Hudson's Bay. Beyond this the declination is east of north. There are slight daily variations, as well as steady long-period changes, in the declination at any place. Lines drawn on the earth's surface to mark those points where the declination is of the same value, are called *isogonic* lines. Lines of no declination, where the magnetic and geographic meridians coincide, are called *agonic* lines. Along these the needle points to the true north; one of

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Chancery Division
congruous to the
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Dee, DR. JOHN (1527-1608), alchemist and astrologer, born in London and educated at Chelmsford and St. John's College, Cambridge, and becoming Fellow of Trinity. He studied mechanics and astrology, and between 1548-89 travelled a good deal abroad, especially in Germany and Hungary. He received ecclesiastical preferment from Edward VI., but in 1555 was charged with compassing Queen Mary's death by magic. He was, however, acquitted, and Queen Elizabeth had a great regard for him, and made him her astrologer, besides visiting him. He appears to have been duped by his assistant into an idea that he had found the elixir of life and had intercourse with spirits, and he searched

for the philosopher's stone. He died in poverty at Mortlake, and was buried there. Most of his works are still in MSS. at the British Museum and at Oxford and Cambridge. Besides his astrological works, he wrote on logic, geography, and navigation, and made some steps towards reforming the calendar.

Deed is an instrument in writing or print upon paper or parchment duly sealed and delivered. The name for a deed in the law French of Littleton and others is *fact*, i.e. *factum*, a thing done, of which deed is the translation. Deeds are of two kinds, *indented* and *poll*—a deed indented is termed an *indenture*, and has (or should have) a waving line cut teeth fashion on one of the edges of the material upon which it is written, usually the top edge, and when the deed consists of more sheets than one on the first sheet only. This formality is, however, often lost sight of, and is of little importance. Objection was once made to a deed indented—that it was *not indented* (i.e. not an indenture). The learned judge before whom such objection was made simply asked for a pair of scissors and himself healed the difficulty. The term indenture also implies that the deed is of two parts, i.e. two parts or copies exactly alike, and the two parts were divided by a line so as to afford additional means of authentication; but except in the cases of leases, marriage settlements, partnership deeds, and some few others, there are seldom more parts than one. The cost of deeds is so heavy, that frequently where two or more parties are equally interested in a deed, it is deposited with some person for their joint use.

A *deed poll* is cut even or polled at the edges, and is usually of one part only, that is, the deed of one party or several parties of the same part. The form commences as in a declaration, "Know all men by these presents." The operative words of an indenture are "This indenture made between (parties) witnesseth." A deed to be *in all respects* absolute and irrevocable must be founded on a valuable or good consideration. [CONSIDERATION.]

A deed should be read over and explained to the parties before execution, which consists of signing, sealing, and delivery of it. Signing is not absolutely essential to the validity of a deed, though it is required as to less formal instruments by the statute of frauds; but sealing is absolutely essential, this being the most ancient mode of authentication and in use from the earliest times. At the present day the seal is no real security against fraud, for any impression upon wax or other substance employed is sufficient. The last requisite to the due execution of a deed is delivery, except in the case of a corporation, where sealing with the common seal has that effect. The usual form of delivery of a deed is for the executing party to say, with his finger upon the seal, "I deliver this as my act and deed." The delivery means that the person whose act and deed the instrument is, and who is bound by it, delivers it to the person who is taking some benefit thereunder. All the parties whose deed the instrument is must deliver it as their deed.

A deed may also be delivered as an escrow, i.e.

to a third person to keep till something is done by the grantee; when the condition is performed the deed becomes effectual. A deed takes effect from the delivery and not from the date. Enrolment and registration are necessary in some cases by statute, and the Revenue laws have imposed certain stamps upon deeds the absence of which renders them inadmissible in evidence.

After execution a deed may become void by erasure, interlineation, or other alteration in any material part, but, generally speaking, such alteration will be presumed to have been made before the execution; at any rate if nothing appears to the contrary. A grantee may also disclaim the grant or disagree thereto, and a deed may be destroyed or cancelled, but such destruction or cancellation will not re-vest the thing granted in the grantor, though all obligations established by the deed between the parties will be at an end. If the deed has transferred property, the property continues transferred, just as if the deed existed; but if the seal be destroyed, the covenants which are to be performed are destroyed, because when any legal proceeding is taken upon the deed, it must be pleaded as a deed, and it is not the deed of the party whose deed it professes to be if that mark is destroyed which is the legal evidence of its being his deed. But as long as the seal is on the deed, and it exists entire, so long is the party whose deed it is bound by the covenant.

Acknowledgment of a deed is required in certain cases by a married woman; such acknowledgment must be taken before a judge or commissioner (formerly, two were required), specially appointed for the purpose of her examination as to its contents apart from her husband, and she must declare it is executed of her own free will. The necessity, however, for this is now much curtailed by virtue of the Married Women's Property Act, 1882.

Deemster (A.S. *dóm*, doom, judgment; compare Engl. *deem*), the two judges of the Isle of Man, possibly the successors of the ancient Keltic priesthood, and at any rate of high antiquity. Till the fifteenth century (like other early judges) they acted according to unwritten laws of which they were the sole depositaries. They now act as legal members of the Council of the Lieutenant-Governor, and have concurrent jurisdiction over the whole island, both civil and criminal. Each has a salary of £1,000 a year.

Deer, the popular name for the members of the family Cervidæ, distinguished from all other Ruminants (q.v.) by the fact that the young are spotted, and by the character of the horns [ANTLERS], which are not borne by females, except in the genus *Tarandus*, and are wholly wanting in both sexes in the Musk-deer and Water-deer. These animals are almost universally distributed, but are entirely absent from Africa south of the Sahara [BARBARY DEER], and from Australia. The lacrymal sinus or tear-pit beneath each eye secretes a waxy substance with a strong odour, probably serving as a means of recognition. It is to this secretion that Shakespeare refers (*As You*

Like It, II. i.) when he describes the wounded deer—

"On the extremest verge of the swift brook
Augmenting it with tears."

Both sexes usually possess canine teeth in the upper jaw, and in some species they are so largely developed in the males as to form effective weapons of attack and defence. The species differ widely in habitat, but generally agree in living in pairs or in small herds under the leadership of an old male, and in feeding on herbage and the tender shoots of trees and shrubs. They vary greatly in size, the elk standing from seven to eight feet high at the shoulder, while the muntjac scarcely reaches a quarter as much. The flesh is eaten, and the venison of some species is excellent; the skin is tanned for clothing and rugs, the antlers are utilised for knife-handles, etc. The family contains about 50 living species, arranged in the following genera: *Alces*, *Tarandus*, *Cervus*, often divided into subgenera, with about 40 species, one of which, the Red-deer (q.v.), is British; *Capreolus*, *Dama*, *Cervulus*, *Moschus* (sometimes regarded as an aberrant bovine) and *Hydropotes*, the chief species of which are described under their popular names.

Deer Forests, tracts of wild mountain and moorland for the preservation of the red-deer. Their extent in Scotland is estimated at a tenth of the whole area, and they stretch virtually right across it. Much feeling has been aroused by the alleged clearances of crofters to make room for deer, and by the fact that the forests are often rented by wealthy strangers, who substitute for the skilful and admirable sport of deerstalking the mere butchery of the deer-drive. The island of Rum is a recent case of clearance. Deer forests should not be confused with the deer parks of England, where the deer are hardly to be regarded as *feræ naturæ*.

Deer Mouse, *Peromyscus leucopus*, a mouse running into the ears of deer, distributed over the greater part of Europe. It is about three inches long, with a white belly and white feet (white-footed mouse), but is usually in hue. [MOUSE.]

Default, a failure to perform an act which one ought to do, or an omission to answer to the plaintiff's demand, or a failure to appear for those purposes. A defendant may have been defaulted if he has no defence to his suit.

CHAMEROND, MARCEL, a French writer and journalist, born in 1864 in the family of a doctor in Paris, and who received a visit from his father, but vainly. He was followed by his mother, who was plunged into the same time. A

biographer styles her *une des filles de joie du lupanar du Palais Royal*. Tiring of this life, she returned to her husband, but after a few weeks left him for ever. In 1778 she had formed a friendship with Voltaire. She later had a *liaison* with Hénault, with whom she remained till his death. She then retired to a convent, where, however, she kept up her mundane acquaintances and habits. At the age of 68 she made the acquaintance of Horace Walpole, and seems to have loved him. Her correspondence was chiefly with Voltaire, the Duchess of Choiseul, and Walpole. She has been looked on as a sort of mirror of the life of the Regency period.

Definite Proportions, LAW OF, formulated by Dalton (q.v.), that substances combine chemically in certain fixed proportions only. [ATOMIC THEORY.]

Deflagration, any decomposition accompanied by noise or explosion. It is also applied to the process in which a substance is oxidised by heating it in the dry state with some other highly oxidised body, as nitre or potassium chlorate, etc.

Deflection, generally, means a change of direction. Thus, in navigation it means the change of course of a vessel; in optics, the change of course of rays of light. Many measuring instruments record their readings by deflection of a needle or pointer, the magnitude of the deflection being a measure of the cause of disturbance and also a measure of the sensitiveness of the instrument.

Defoe, DANIEL (1661–1731), of world-wide renown as the author of the immortal *Robinson Crusoe*. His father, who called himself simply Foe, was of Northamptonshire origin, and was a butcher at St. Giles's, Cripplegate. The son was originally intended for the ministry, but eventually became a horse-factor, was concerned in Monmouth's rebellion, and in 1688 was in William III.'s army. He then travelled in France and Spain, and was later secretary in a pantile factory at Tilbury. He made his literary *début* as a pamphleteer, and in 1701 he published a poem—*The Truicorn Englishman*—in which he apologised for William III.'s Dutch extraction. A satire in 1703—*The Shortest Way with Dissenters*—cost him a trial at the Old Bailey, a fine of 200 marks, three exposures in the pillory, and imprisonment. The mob cheered him as he stood in the pillory, and his *Hymn to the Pillory* made a great sensation. While in prison he started his *Review*, which lasted from 1704 to 1713, and was a monument of industry. Released in the summer of 1704, he was patronised and employed by Harley, who recommended him as a useful man to Godolphin, who sent him on a mission to the West of England and to Scotland. In 1709 he wrote a *History of the Union*, and on the return of Harley to power in 1710 did much service as a political writer. He seems to have had little political principle, and to have been a sort of "Vicar of Bray," editing Jacobite papers, with, however, the intention and effect of making them harmless to the Government. His inconsistency became more conspicuous after the Hanoverian

succession, and he speaks of himself as having "bowed in the house of Rimmon." In 1719 he issued the first two volumes of *Robinson Crusoe*, which he founded upon the story of Alexander Selkirk, transmuting, however, the leaden facts into pure and valuable gold. The same year saw the appearance of *Duncan Campbell, Memoirs of a Cavalier*, and *Captain Singleton*. In 1722 Defoe published *Moll Flanders, History of the Plague of London*, and *The History of Colonel Jack*. He wrote also many other works. In the latter part of his life he lived at Stoke Newington, and seems to have had some family troubles. He was buried at Bunhill Fields.

Deformities may be classified under the two heads, congenital malformations and acquired deformities. The latter result from injuries and from certain forms of disease (e.g. rickets) occurring after birth, and will be no further considered here. Congenital malformations are due to some disturbance in the natural development of the foetus within the uterus. Imperfect closure of the cerebro-spinal cavity produces the conditions known as *hernia cerebri* and *spina bifida*. Defects in connection with the branchial arches may result in *cleft palate*, *hare-lip*, and *fissure of the neck*. The vitalline duct may persist, producing what is known as *Meckel's diverticulum*. Other deformities which may be mentioned are the various forms of club-foot and the rare condition known as transposition of viscera. When the deviation from the normal condition is very great, what is known as a "monster" results. Where two rudimental embryos are involved in the perversion of development, a "double monstrosity" is produced.

Degarû, a branch of the Mishmi nation, North Assam highlands, between the Midhi and Neju, with distinct speech; "unmistakable Mongolian features" (T. T. Cooper, *Mishmi Hills*); there are three divisions—Yo-en, Tarying, and Brama.

Degeneration, in *Pathology*, certain alterations of the tissues of which the body is composed, which have been described by the morbid anatomist and pathologist. Lardaceous, waxy, or amyloid degeneration occurs in cases of long-continued suppuration, and affects mainly the liver, kidneys, spleen, and intestines. On microscopic examination of the diseased parts a new deposit of colourless refractile "amyloid" material is found to be present for the most part in the walls of the small arteries. The exact composition of this amyloid matter is not known; it seems to be allied to the substances known as proteids. Fatty degeneration is a term of somewhat undefined significance. It is applied to mere overgrowth of fatty tissue, to the distension of cells with oil drops, as in fatty degeneration of the liver, and to the breaking up of the protoplasm of cells which is met with in such a condition as fatty degeneration of the heart. Calcareous degeneration is of particularly common occurrence in the internal coats of arteries. In extreme instances the artery may become converted into a perfectly rigid tube. It is a condition met with in advanced life, and may result in rupture of the vessel, or in

gangrene, from failure of the artery to respond to the varying needs of the parts supplied by it with blood. Other forms of degeneration which may be mentioned are mucous and colloid degeneration, pigmentary degeneration, and uratic degeneration.

In *Biology*, the operation of the disuse of parts, through the laws of economy of nutrition and of acceleration of development, to produce a simpler structure. It is especially characteristic of organisms that lead a parasitic or otherwise sedentary life, in which case it will affect organs of locomotion, organs of special sense, which especially subserve the capture of food, and even the nutritive and food-elaborating organs themselves. Under other circumstances, increased facilities for growth, for longevity, or for asexual reproduction may lead to degeneration so far as sexual characters are concerned. It is a moot question whether the reduction of organs which undoubtedly results from their disuse, by the law of economy of nutrition, is directly inherited, it being an acquired character, or whether individuals arising by spontaneous variation with reduced organs merely survive as the most fit. When, however, a structure is aborted or suppressed, its abortion or suppression tends, according to the law of acceleration of development, to occur at a slightly earlier period in the life of each successive generation. Parasitism (q.v.), for instance, may at first be only occasional and partial; but among flowering plants, when habitual, it means obtaining elaborated food made up of organic substances and rendering the action of chlorophyll (q.v.) upon atmospheric carbon-dioxide unnecessary. The leaves and stems of many parasites accordingly contain little or no chlorophyll and are brown, the leaves also being commonly much reduced in size. The same changes occur in some plants which are saprophytes (q.v.), living among dead leaves or other decaying organic matter. Entozoa, or internal parasitic worms, illustrate several phases of extreme degeneration, being in some cases destitute even of a mouth. In the Ichthyophthira, crustaceans which become parasitic upon fish, the embryo has eyes and swimming organs which are lost in the adult, as is also the case with the barnacles, which are merely sedentary and not truly parasitic. One of the most striking cases of degeneration is that of the ascidians [TUNICATA], which possess a true vertebrate notochord in their larval stage and afterwards lose it, being in fact a side branch of the ancestral Vertebrata degenerating when adult to the grade of the lowest mollusks. Apogamy (q.v.), or the loss of the sexual process, accompanied by increased means of vegetative reproduction, as in the mushroom, is another case of degeneration, and the reversion of the bee-orchis to self-pollination, whilst belonging to a group all specially adapted for insect pollination (q.v.), may be regarded in the same light.

De Gerando, JOSEPH MARIE, BARON (1772-1842), a French writer and philanthropist, born at Lyons of a family of Italian origin. In 1797 he came to Paris, but soon afterwards went to Germany, where he enlisted in Massena's army. He here wrote a treatise which was crowned and

published in 1800 with the title *Des Signes et de l'Art de Penser*. In 1803 he published *Histoire de la Philosophie*, and in 1804 he became a member of the Academy. Napoleon made him secretary-general to the Ministry of the Interior. In 1820 appeared his *Visiteur des Pauvres*, and in 1824 a treatise *Du Perfectionnement Moral*. He was made a peer of France in 1837.

Degree is a measure of an angle. It is the 360th part of a complete rotation, and is therefore the 90th part of a right angle. It is subdivided into 60 minutes, and each minute into 60 seconds; in cartography and navigation, the $\frac{1}{360}$ th part either of any circumference of the earth which passes through the poles, or of any circle drawn about the earth parallel with the equator. The circumference of the earth through the poles being constant, any $\frac{1}{360}$ th part of that circumference is, of course, the same in length as any other. The degree of latitude, in consequence, does not vary in length, and measures a little less than 60 geographical miles, or admiralty knots of 6,080 feet each. The degree of longitude, on the other hand, varies in length at every latitude north or south. At 0° latitude, i.e. at the equator, a degree measures exactly 60 nautical or geographical miles, that is, 69·173 statute miles. At intervals of 10 degrees of latitude the length of a degree of longitude, in miles, is as follows:—

Latitude.	Miles.	Latitude.	Miles.
0°	69·07	50°	44·85
10°	67·95	60°	34·50
20°	64·84	70°	23·60
30°	59·75	80°	11·98
40°	52·85	90°	0·00

Degree, UNIVERSITY, a title conferred on persons who have shown proficiency in arts, law, theology, science, or divinity. In the school of law at Bologna early in the 12th century the teachers of civil law formed themselves into a corporation of "doctores" who were admitted to it thenceforward the students were required to prove their fitness by examination. In 1158 Eugenius III. arranged that the title of doctor should be conferred on the holders of a certain number of degrees in theology and law. The University of Paris by the 13th century had conferred degrees in arts, law, and medicine. "Bachelor," originally meant only a student who had completed a certain time; "licentiate" was a private examination held a public disputation; "master," a faculty of Arts, was given after a year's apprenticeship). "Bachelor" is modern students, however, though that the title still survives. Some of these, and others extremely lax, were given for a fee, and a certain essay, which was a duty. Thus, an

Englishman in the 18th century obtained the degree of Doctor of Divinity (in absence) for a certain "Anglicus Ponto," who turned out to be his dog. Professor Mommsen's exertions some years ago stopped this practice in Germany, and it has also been checked in the United States. Besides the old degrees, there are the modern Bachelor and Doctor of Science, Doctor of Letters, and many strange American novelties, e.g. "Bachelor of Architecture" and (at Ladies' colleges) "Mistress of Music." "Lambeth Degrees" are conferred by the Archbishop of Canterbury in accordance with an Act of Henry VIII. transferring the power of doing so to him from the Pope. M.A. is the most usual; of late years it has only been conferred after examination. Honorary degrees—usually in law for laymen and divinity for clergymen—are conferred on distinguished strangers by many universities.

Dehgan, a numerous people of the Kunar valley and parts of Laghmân, north-east Afghânistân, who are the Laghmâni mentioned in Sultan Baber's History; they differ considerably from the surrounding Afghân tribes, especially in their language, which is substantially neo-Sanscritic modified by contact with Persian and Pukhtu, and also containing an unknown element; there are six divisions—Dunieh, Chaguni, Kuli, Buzurg, Deba, and Malik. The Dehgans are comparatively recent converts to the Mohammedan religion, and still retain many pagan rites or practices (MacGregor).

Dehiscence, or splitting, a term applied, in botany, especially to the bursting of the anther or of the fruit. The anther generally dehisces *longitudinally*; but, when short, sometimes *transversely*; in the heath-tribe, more especially, by a terminal *pore*; and, in the barberry and the bay, by the formation of flap-like *valves* or *opercula*. Dehiscence, which accompanies the ripeness of the pollen, results from the absence of thickening bands in certain cells of the *endothecium*, or inner membrane of the wall of the anther. Among fruits, dehiscence is mainly confined to dry fruits containing more than one seed, the others being *indehiscent*. The succulent fruits of the horse-chestnut, balsam, walnut, and yellow water-lily are exceptional in being *dehiscent*. Fruits may dehiscence by *pores*, as in the capsules of the poppy and snapdragon; *transversely*, as in the pimperl (*Anagallis*) and plantain (*Plantago*); by teeth, as in *Primula* and the pinks; or *longitudinally*. The legume splits longitudinally down both sutures; the follicle, as in the larkspur, down the ventral suture only. Where the fruit is syncarpous, dry, and many-seeded, it splits into valves, which may each be a carpel or halves of two contiguous carpels. [CAPSULE.]

Dehwar (DIWAR, DIHKAN), the collective name of the Persian-speaking communities scattered over eastern Irania (Afghânistân and Balûchistân); are numerous, especially in the Sarawân uplands, and in the Herat, Kabul, and Kalat districts. Many are now occupied with trade; but all were originally agricultural settlers, whence their name, which means "villagers" or "husbandmen," from *deh*,

village. These Tajiks (Persians) "are Iranians, a remnant of the old Persian population subdued by the Afghans, but still speaking Persian and retaining the Persian type of features" (F. V. Stein, in *Petermann*, March, 1879). Those of Balûchistân are classed by Robertson (1841) in five main divisions—Sewa, Ali, Moghal, Tolonti, and Doda-khân. The total population probably exceeds one million.

Deianeira, daughter of Æneus, king of Caledon, was very beautiful, and had many suitors. She promised to bestow her hand only upon the strongest, and this was Hercules, whose wife she became. Nessus the Centaur, while bearing her over a river, offered her violence, and Hercules shot him with a poisoned arrow. Before dying he gave his shirt stained with poisoned blood to Deianeira as a sure means of reclaiming the love of her husband, should it ever wander. When the occasion arose she gave the shirt to her husband, who put it on. The poison ate into his flesh, and in agony he burnt himself upon Mount Ætna. Deianeira killed herself from grief and remorse.

Dei Gratia (Latin *by the grace of God*), a qualification of their title originally used by bishops and ecclesiastical dignitaries, probably first in the 4th century, afterwards adopted by secular potentates. Ethelbert adopted the title "Dei Gratia Rex Anglorum" in 605 A.D. Charles the Great described himself as "Dei Gratia Rex Regnique Francorum Rector." The first florins coined in England were without the letters "D. G.," but owing to the indignation expressed by the religious world the coinage of them was stopped.

Deinosauria. [DINOSAURIA.]

Deinotherium. [DINOTHERIUM.]

Deira, an ancient Saxon division of Anglia, from the Tees to the Humber, and to the West as far as Cumbria. Bernicia, to the north, was afterwards joined with it to form the kingdom of Northumbria, but they were again separated into earldoms. The name gave Pope Gregory the occasion of making his celebrated puns about the Saxon slaves at Rome, who from *Angli* were to become *Angeli*, and be plucked *de ira Dei*.

Deist (Latin *Deus*, God), a term now usually applied to those who believe in a God, but deny miracle or supernatural relation [THEISM], and especially to a series of English writers beginning with Lord Herbert of Cherbury (died 1648), and comprising the second Lord Shaftesbury, Antony Collins, Matthew Tindal, Mandeville, Toland, Chubb, and Thomas Paine (died 1809). Their opinions and treatment of religious subjects varied greatly. Lord Herbert of Cherbury believed that the idea of God and moral principles were innate; Lord Shaftesbury, in polished language, exalted natural religion and its professors at the expense of Christianity; Toland and Collins treated the Scriptures as forgeries; Tindal argued that they were genuine in substance, but mere documents of natural religion; Mandeville held that morality was simply based on self interest, and argued that "private

vices were public benefits." Doubtless the movement owed much to the philosophy of Locke. Though a decided believer in Christianity himself, his empiricism and his strenuous insistence on the claims of reason were pushed farther than he intended by the Deists. But the tendency of the age was strongly opposed to "enthusiasm" and mysticism in religion, and Deism is an extreme expression of this opposition. Much can be learned about it from the *Alciphron* of Berkeley (who, however, was strongly biassed against it); while, amongst others, Leland, the German historian Lechler, and Leslie Stephen (*English Thought in the Eighteenth Century*) have dealt with the movement historically. (See also articles on the above-named writers.)

Déjazet, PAULINE VIRGINIE (1797–1875), a French actress born in Paris. She went on the stage at the age of five, and played for some time the parts of children, boys, and soubrettes at Lyons. In 1821 she entered at the Gymnase, where she played till 1834, when she migrated to the Palais Royal. From 1844 to 1849 she played at the Variétés. She played in Paris, in the provinces, and in London. In 1859 she took the management of the Folies Dramatiques, and in 1868 retired upon a pension of £80. For her vivacity, spontaneousness, and perpetual youth she has been called the "actress of young people," and compared to Anacreon's cicada.

Dekker, THOMAS (1570–1637), a prolific English dramatist, much of whose writing, however, was done in collaboration. In 1600 appeared his *Shoemaker's Holiday* and the *Pleasant Comedy of Old Fortunatus*. In 1602, in return for Ben Jonson's hostility, which had taken the place of former friendship, he satirised the poet in *Satiromastix*. In 1603 appeared *The Wonderful Year*, which commemorated the Plague, and the *Bachelor's Banquet*. In 1604 he wrote, with Middleton, the *Honest Whore*, and in 1607, with Webster, *Westward Ho! Northward Ho!* and a fragmentary play, the *History of Sir Thomas Wyatt*. In 1608 he wrote a pamphlet, the *Bellman of London*, and another called *Lanthorn and Candlelight*; in 1609 the *Gull's Hornbook*; in 1611, with Middleton, the *Roaring Girl*; and he joined with Massinger in writing the *Virgin Martyr*. In 1624, with Ford, he produced the *Sun's Darling*, and later, with Ford and Rowley, the *Witch of Edmonton*. After 1637 he disappears from the scene. As he had already been more than once imprisoned for debt, this may have also been his ultimate fate.

De La Beche, SIR HENRY THOMAS (1796–1855), an English geologist. He was educated at Great Marlow, and joined the army in 1814. In 1817 he became a Fellow of the Geological Society, of which he was afterwards secretary and (1847) president. In 1820 he wrote a paper upon the depth and temperature of the Lake of Geneva, and in 1824 he wrote upon the geology of Jamaica. In 1831 appeared his *Manual of Geology*, in 1834 *Researches in Geology*, and in 1853 his *Geological Observer*. He was appointed chief of the Government Geological Survey, and in 1848 he was

knighted. He also received honours from the Danish and Belgian Governments, and was a corresponding member of the Paris Academy of Sciences. His geological collection in Craig's Court was the nucleus of the present Jermyn Street Geological Museum and School of Mines.

Delacroix, FERDINAND VICTOR EUGÈNE (1799-1863), a French painter of the romantic school, born at Charenton St. Maurice, near Paris. He entered the studio of Pierre Guérin, a follower of David, and here he had Géricault as a fellow pupil, whose influence showed itself in Delacroix's work. In 1822 appeared his *Dante and Virgil*, which was commended by M. Thiers, and in 1824 his *Massacre of Scio*. In 1831 his *Liberty directing the People at the Barricades* attracted much notice. In 1832 he went to Morocco, and the study of light there and of costumes had a great effect upon his subsequent work. He did much lithographic drawing, and his illustrations of Faust were highly approved by Goethe.

Delagoa Bay, a Portuguese possession on the S.E. coast of Africa. In 1875 a difficulty between England, Portugal, and the Transvaal as to the bay was submitted to the arbitration of the President of the French Republic. The chief point was as to the possession of Inyak Island and the Maputa river, and the southern part, including the Maputa river up to the Lobombo Mountains, was declared Portuguese territory. The bay, stretching from lat. 25° 30' to 26° 20' S., has a width of 25 miles, and, though having many islands and shoals, is of easy navigation, and affords good anchorage. The principal rivers falling into it are the Maputa and the Komati, and the Maputa with its tributary the Tembe is navigable in its lower course. A railway was opened in 1890 to the frontier of the Transvaal, and will, owing to the presence of the gold-fields, become more and more important. In 1889 this bay was the scene of a serious difficulty between Portugal and the United States, which was referred to arbitration. Drainage works have been done much to render the bay more healthy and free from malarious Portuguese settlements and fortifications.

Delambre, JEAN DOMINIQUE (1749-1822), a French astronomer, born at Amiens, and educated at the University of Paris. He was the Abbé Delille made famous by his translation of Virgil. He then turned to astronomy, and studied under Laplace. His best work was his *Tables du Soleil*, which he published in 1791, and for which he was elected to the Academy of Sciences. He was elected to the Academy of Sciences in 1802, and in 1803 he was appointed director of the Observatoire de Paris. He was elected to the Academy of Sciences in 1802, and in 1803 he was appointed director of the Observatoire de Paris. He was elected to the Academy of Sciences in 1802, and in 1803 he was appointed director of the Observatoire de Paris.

Delane, JOHN THADEUS, (1817-1879), the son of a barrister, was born in London. He studied at the hospitals, went to the bar, and finally took to reporting in the House of Commons. The attention of the proprietor of the *Times* was drawn to him, and he was appointed on the *Times* staff, becoming editor in 1841. This post he filled till 1877, being aided for much of the time by his brother-in-law, Dr. Dasent (q.v.).

Delarey, or DE LA REY, GENERAL, one of the Boer commanders who during 1900 and 1901 maintained so successful a resistance to the British troops. Delarey had been a member of the Transvaal Volksraad, and was opposed to the issue of the ultimatum, but when the war had begun, he threw himself into it with the greatest vigour. In March, 1902, he defeated and captured Methuen at Tweebosch. He afterwards took part in the Peace Conference. At the close of the war he came to England together with Generals Botha and De Wet, and afterwards visited various Continental cities endeavouring to raise funds for his countrymen.

Delaroche, HIPPOLYTE PAUL (1797-1856), a French painter of the Eclectic school, born at Paris. He studied under Baron Gros, and in 1824 his picture of *St. Vincent de Paul Preaching before Louis XIII.* brought him into notice, as did his *Joan of Arc before Cardinal Beaufort*. He then turned his attention especially to historical subjects, and between 1826 and 1837 he produced the *Death of President Durante*, *Death of Queen Elizabeth*, *Princes in the Tower*, *Cromwell and Charles I.*, *Execution of Lady Jane Grey*, *Charles I. and Parliamentary Soldiers*, and *Strafford receiving Laud's Blessing on his way to Execution*. From 1837 to 1841 he was occupied in adorning the *École des Beaux-Arts*.

De la Rue, WARREN, an English electrician, born in 1815 in Guernsey, was educated in Paris, and became a member of the noted paper manufacturing firm. He had much to do with the Exhibitions of 1851 and 1862, and took part in the International Electric Congress at Paris in 1861. He was president of the Royal Astronomical Society, of the Chemical Society, of the London Institution, and also secretary of the Royal Institution. In 1880 he was made corresponding member of the French Academy of Sciences. He died in 1889.

Delaware, one of the United States of America, forming part of a peninsula, and having the Susquehanna and Chesapeake Bay on the W., Delaware river, bay, and the ocean on the E., Pennsylvania on the N., and Maryland on the S. and W. It is 2,050 square miles in extent, thus being the second smallest of the States. The state is hilly in the N., the hills being formed of granite, gneiss, and limestone. South of this is a strip of red clay, followed by greensand and sand, and the southern part consists of swamp and sand. On the coast are salt marshes, succeeded by fertile alluvium. In the west, wood is abundant. The state keeps the old-country names of Kent, Sussex, and Newcastle for its three counties, and is also divided into hundreds. The rivers are small but navigable,

and a canal connects Chesapeake and Delaware bays. Among the productions are kaolin and iron ore; but the chief industries are agriculture, market-garden produce, and fruit, especially peaches, and fishing, particularly of oysters and crabs. Of the population of 184,735, about one-sixth are negroes; and Delaware was formerly a slave state, though it did not take part in the Secession. The capital is Dover; but the largest town is Wilmington. The district was formerly settled by Swedes and Finns, but became Dutch in 1655, passing to the English in 1664.

Delaware Indians, a large division of the Algonquian race [ALGONQUINS], of which they regard themselves as the elder branch or original stock, whence their national name *Lenni Lenâpé*, "Genuine" or "Trueborn Men." Their original domain comprised Delaware, with parts of New Jersey, Pennsylvania, Maryland, and Virginia, where they formed the league of the "Five Delaware Nations," which also comprised the now extinct Mohicans. But this league was broken up at an early date by the more powerful Iroquois Confederacy [IROQUOIS], and in the seventeenth century the Delawares proper were confined to the banks of the Delaware and Schuylkill rivers. It was here that William Penn concluded his famous treaty with them in the year 1682 beneath the shade of the Shackamaxon elm, where he founded the city of Philadelphia. But this treaty of "Brotherly Love" did not save them from the irresistible advance of the white settlers; and at present the Delaware nation is confined partly to a Reserve (Kiowa and Wichita Agency) in Indian Territory, and partly to the Six Nations' Reservation of Ontario, Canada. The latter now usually speak Minsi; but the original Delaware, a typical Algonquian language, was first reduced to writing by the Moravian Brethren, who began to evangelise these Indians about the year 1740. David Zeisberger's Grammar was published in the *Transactions of the American Philosophical Society* in 1827, and his Dictionary was issued at Cambridge, Massachusetts, in 1887. A fuller dictionary from an anonymous MS. was edited by Dr. D. G. Brinton for the Pennsylvania Historical Society, Philadelphia, 1888. *The Lenâpé and their Legends*, by the same author, appeared at Philadelphia in 1885.

Delescluze, LOUIS CHARLES (1809-1871), a French Communist, born at Dreux. He studied law at Paris about 1830, and, becoming a journalist, adopted advanced political views and took part in revolutionary movements. He was imprisoned and fined and sentenced to banishment for revolutionary articles. He escaped to England, but, returning to France in 1853, he was imprisoned and banished to Cayenne. He returned to France in 1869, and became a prominent member of the Commune in 1871, when he was shot at a barricade. Besides his fugitive writings, he wrote *De Paris à Cayenne*, *Journal d'un Transporté*.

Delfshaven, a town of South Holland, on the Maas, $1\frac{1}{2}$ miles W. of Rotterdam. There is some shipping.

Delft, a town of South Holland, on the Schie, 8 miles N.W. of Rotterdam. It is intersected by canals, and among its notable buildings are the seventeenth-century town-house; a fifteenth-century church, which has monuments to William I. of Orange, who was assassinated at Delft, and to Grotius, and contains the vaults of the royal family; and a church in which Admiral Van Tromp and the naturalist Leeuwenhoek are buried. There are also an arsenal and East Indian College and a Polytechnic. The old manufacture of pottery, for which Delft was famous, has passed away; but there is a manufacture of carpets, casks, and baskets.

Delhi, or DILLI, a division, a district, and its capital in the Punjab, British India. The division covers an area of 5,609 square miles, lying between the Ganges E. and the deserts of Mooltan W., being bounded S. by Rajpootana and N. by the outlying spurs of the Himalayas. It includes the districts of Delhi, Gurgaon, and Karnal. The district comprises 1,227 square miles. The soil is sandy and the climate warm and dry. Cultivation is dependent on irrigation, which is supplied from the Jumna and its tributaries with several large artificial canals. The bulk of the population is Mohammedan. The city, situated on the right bank of the Jumna, and known in early times as Indraprestha or Inderput, became, after the conquest of North-Western India, the capital of the Mogul Empire, and was then called Shahjehanabad, from the sovereign who enclosed it with a stone wall and adorned it in other ways. In the height of its prosperity its circumference is said to have been thirty miles, but at present this is reduced to eight miles. Many of the old palaces and gardens are mere ruins, but the palace of the Great Mogul, the Jumna Musjid, the Souna Musjid, the tombs of Humaon and Nizam-ud-Deen, and the fort of Salimgarh, are noble specimens of Mussulman architecture. Several of the streets are broad, straight, and finely laid out. The Delhi College, founded in 1792, is an important educational centre. The British under Lake took possession of the city in 1803, and it has remained in their hands ever since, with the exception of a brief period of four months during the Indian Mutiny (1857), when it was recaptured from the rebels by Sir R. Archdale Wilson. The chief local manufactures are gold filigree work, shawls, and embroideries, but being a dépôt for the trade between Calcutta, Bombay, and Rajpootana, Delhi is one of the most important markets in British India.

Delilah, or DALILAH, a woman who lived in the valley of Sorek in the territory of Dan and near the Philistine frontier. Samson, the Israelite champion, in one of his frequent fits of amorous weakness, became attached to her, and she, under the influence of Philistine bribery, beguiled him into revealing that the source of his strength lay in his hair (Judges xvi.). Having shorn him of his locks she then betrayed him to his enemies. [SAMSON.] Delilah thus became a type of feminine treachery, but Milton in his *Samson Agonistes* puts

into her mouth excuses that support a more lenient view of her conduct.

Delille, JACQUES, the illegitimate son of a French lawyer, was born at Aigueperse in 1738. He early acquired a reputation for scholarship, and became professor at Beauvais, Amiens, and finally at the Collège de la Marche in Paris. In 1769 he published a verse translation of the *Georgics* which won him the chair of Latin Poetry at the College of France as well as admission to the Academy. *Les Jardins* was his next work, and then, after travels in Greece and the Levant, he wrote *L'Imagination*. Ruined by the French Revolution he took refuge in Switzerland, Germany, and England, completing in London his translation of the *Paradise Lost*. In 1802 he returned to Paris and was restored to his professorship. *La Conversation*, *La Pitié*, *The Æneid*, and other poems with many essays flowed from his pen before his death in 1813. He lacks the fervour of genius and displays little power of invention, but his versification is sweet and melodious, whilst his sentiments are always moral and sometimes pathetic.

Deliquescence. Certain substances which, when exposed to the air or to an atmosphere containing moisture, absorb water, become moist, and finally liquefy. Such substances are said to be *deliquescent*, and the phenomenon is known as *deliquescence*. Notable examples are calcium chloride, phosphorus pentoxide, and potassium carbonate.

Delirium (Latin *deliro*, to go out of the way: *de*, away; *lira*, a furrow). Hobbes defines delirium to be "too much appearing passion." Madness may be said to be habitual delirium, and delirium may be regarded as a temporary madness. The popular equivalent for the term delirium is light-headedness. Delirium is often associated with fever, and may then be due to disease of the brain (*e.g.* meningitis), or be symptomatic of one of the specific fevers (typhus, typhoid, malaria, &c.). Or delirium may be unassociated with fever, and may be caused by belladonna or alcohol, or by some other toxic disease, and in dying persons. Delirium is largely dependent on the condition of the brain, and is to procure sleep. Delirium is often caused by cold to the head is often.

Delirium 7 [unclear]

Delitzsch, [unclear] Germany, on the right bank of [unclear] N.W. of Leipzig. [unclear] woollen cloth [unclear] the seat of [unclear]

[unclear] in 1813, [unclear] student of [unclear] *English Poetry* [unclear] successful [unclear] *Biblical* [unclear] *Day in* [unclear] on Isaiah.

Delius, CHRISTOPH TRANGOTT, born in Saxony about 1730, devoted his life to practical mineralogy, and wrote a treatise entitled *Directions for the Working of Mines*. He was appointed counsellor for the department of mines and director of the mint at Vienna, and died in 1779.

Della Cruscan, a set of writers of affected and insipid English verse, who resided at Florence towards the close of the 18th century, and borrowed their name from the Accademia Della Crusca, a learned society at Florence. They were savagely satirised by Gifford (q.v.) in the *Bariad* and *Mariad*.

Delolme, JEAN LOUIS, was born at Geneva in 1740, and educated for the bar, but a political pamphlet caused his early expulsion from the Swiss Republic, and he wandered about Europe in great poverty. He settled down as a journalist in England, where he produced (1771) his well-known treatise on *The Constitution of England*, a performance highly creditable for a foreigner, and esteemed by weighty authorities at the time of its publication, but now almost forgotten. His minor works were unimportant. He returned to his native country shortly before his death in 1806.

Delorme, MARION, the daughter of a respectable bourgeois at Blois, was born about 1612, though some doubt exists on both these points. She grew up beautiful and clever, but her moral character left much to be desired, and whilst a mere girl she became the mistress of the poet Desbarreaux. She next transferred her affections to Cinq Mars, and among his successors were the Duke of Buckingham and perhaps Louis XIII. himself. Her drawing-room in Paris divided with that of Ninon de l'Enclos the reputation of being the rendezvous of all the wits, politicians, and intriguers of the day. She mixed herself up in the affairs of the Fronde, and after the arrest of Condé would probably have been consigned to prison had not sudden death cut short her career in 1650. The story that her decease was a mere pretence, that she lived for many years in England, returned to Paris, married Lebrun, and expired poverty-stricken and obscure in 1706, cannot be regarded as trustworthy. Her strange adventures supplied Victor Hugo with a plot for one of his most famous dramas.

Delorme, PHILIBERT, born at Lyons about 1518, studied architecture in Rome and became thoroughly imbued with the principles of classical art. His first patron was Cardinal Du Bellay, through whom he obtained the favour of Catherine de Medici and Henry II. He built the crescent at Fontainebleau, the châteaux of Anet and Meudon, and began the palace of the Tuileries. Primaticcio assisted him in many of his designs. His writings as well as his buildings contributed much to the development of the French Renaissance. He died in 1577.

Delos, or ORTYGIA (mod. *Dhilos*, a name which includes the adjacent island of Rhenea), an island in the Ægean Sea, forming one of the group known as the Cyclades, and lying to the N. of Naxos, Poseidon, according to legendary tradition, caused it to rise from the waters as a refuge for Leto when

pursued by the jealousy of Here. It was, therefore, held sacred to Phœbus (Apollo) and Artemis (Diana), the twin children of the fugitive, who were born there. So sacred was the spot that neither births nor deaths were permitted to take place in the island, and once in every four years a religious deputation was sent thither from Athens. The oracular shrine of Apollo on the western coast at the foot of Mount Cynthus was regarded as one of the Seven Wonders of the World. Though Darius and Xerxes respected the sanctity of the spot, it was devastated by Mithridates and never recovered. In the 2nd century B.C. it was a great slave mart. It is now uninhabited, though shepherds from the adjacent islands now and then bring their flocks over.

Delphi, or PYTHO (mod. *Castri*), a town of ancient Greece, in Phocis, at the foot of Mount Parnassus, eight miles from the shore of the Gulf of Corinth. It was the great centre of Greek religion, the seat of the most famous oracle and temple of Apollo, the meeting-place of the Amphictyonic Council, and the scene of the Pythian games. It was specially influential in the history of Greek colonisation (since the priesthood who directed the oracle obtained from their numerous visitors the best available geographical information) and during the 6th and 7th centuries B.C. in directing Spartan policy. The prophetic responses of the priestess, who had her seat on a tripod at the mouth of a vapour-breathing cave, were sought not merely by Greeks but by envoys from barbaric nations, and costly gifts poured in from all quarters to enrich the altar of the god. In earliest times the oracle generally delivered itself in verse, but the source of all poetical inspiration found it difficult to satisfy later critics, and fell back, therefore, on prose. The last utterance delivered from the shrine was a wail of despair elicited by Julian the Apostate (362 A.D.) when he purposed to restore the ancient temple, which had frequently been pillaged and destroyed. In 1894, during excavations under French auspices, remains of the temple and other antiquities were discovered.

Delphinapterus. [BELUGA.]

Delphinidæ. [DOLPHIN.]

Delphinium. [LARKSPUR.]

Delta, so named from the resemblance in form of that of the Nile to the triangular Greek capital letter D, Δ, is a tract of flat land of alluvial origin, formed by the advance of the fan-like cones of sediment carried down by a river into a lake or the sea. These accumulations cause the stream to subdivide repeatedly, so that the triangular plain with its apex pointing up-stream is traversed by innumerable tortuous water-channels. These are constantly silting up, while new ones are cut through the soft earth. The delta of the Nile is the whole of Lower Egypt below Cairo; that of the Rhine includes all Holland: the Rhone has two deltas, one at the head of the Lake of Geneva and the other below Avignon: the delta of the Tiber advances 10 feet annually; and that of the Mississippi, covering 40,000 square miles, gains 86 yards a year.

Delta Metal, an alloy used for various parts of machinery. It is similar in character and behaviour to phosphor-bronze, being a brass into which manganese and a little silicon have been introduced.

Deltidium, the triangular area between the beak and the hinge of the larger valve of Lamp Shells and other Brachiopoda (q.v.).

Deluge (Lat. *diluvium*, flood), a term applied specially to the great flood recounted in Genesis vii., viii. The traditions of many nations, however, refer to a similar deluge. The *Chaldean Account of the Deluge*, discovered and published by Mr. George Smith in 1872, exhibits striking resemblances to the Biblical account, but is, of course, markedly polytheistic. An Indian tradition not found till the 12th century A.D. is almost certainly derived from the Chaldean. The best-known Greek deluge-myth is that of Deucalion (q.v.). Numerous deluge traditions exist also among the North American Indians and the Polynesians, but must be received with some suspicion, having probably in some cases been suggested by the incautious questioning of the missionaries. The question whether the deluge was total or partial has been much discussed. The geological difficulties in the way of the former view are so considerable that commentators incline to the latter.

Demavend, MOUNT, a volcanic cone said to form the highest point (20,000 feet) of the Elbruz range in Persia, 40 miles N.E. of Teheran. A town at the foot bears the same name, and is the capital of the province of Tabaristan.

Demerara, a river and a province in British Guiana, on the N.E. coast of South America. The former rises in lat. 5° 20' N., and, after a course to the N. of about 180 miles, flows into the sea between the Berbice and Essequibo rivers in lat. 6° 50' N., long. 58° 20' W., forming a broad estuary and being navigable for 100 miles. The province is the most central of the three that make up the colony of British Guiana (q.v.), and has a coast-line of 100 miles. Originally occupied by the Dutch, it was finally added to England by the Treaty of Paris, 1814. The soil is alluvial and rich near the coast; but about 20 miles inland there is a belt of sand, and beyond these rise steep granitic ranges, of which Roraima is the highest point. Georgetown, formerly Stabrock, the capital and the centre of government, is at the mouth of the Demerara river, which is guarded by Fort Frederick William, an obsolete structure, and is provided with a light-house. A railway connects the town with Mahaica to the east.

Demeter, in Greek mythology, was the personification of nature as the universal mother (Gk. *gē*, earth; *mētēr*, mother), as Zeus or Jupiter was the father of the air or firmament, both being the children of Chronos. Their union led to the birth of Persephone (Proserpina). When she was carried over by Aidoneus (Pluto), Demeter in her grief wandered over the earth, and threatened to starve the human race by refusing her kindly offices. Being welcomed with hospitality at Eleusis, she

favoured the spot ever after, and became associated with Dionysus (Bacchus) in the Eleusinian Mysteries. In many other places her worship was kept up, and she was identified with the Roman Ceres (q.v.). She was generally represented seated in a chariot drawn by dragons or fierce animals, bearing a basket on her head and some ears of corn in her hand.

Demetrius, son of Ivan IV. of Russia, was an infant at his father's death in 1582. His uncle Boris Grodonov put him to death in order to improve his chance of succession, and in consequence a number of pretenders adopted his name, one of them actually being acknowledged as Czar for a few months in 1605. The rise of the Romanoffs in 1613 put an end to the false Demetriuses.

Demetrius Phalereus, born at Phalerum in 345 B.C., and gifted with high eloquence, joined the Macedonian party and was elected Archon in 317. During ten years he ruled wisely and prosperously; but the return of Demetrius Poliorcetes in 307 roused the dormant patriotism of the citizens, and he fled to the court of Ptolemæus Soter in Egypt. There he lived for a time in literary ease, and is said to have assisted in forming the Alexandrine library. His attempt to exclude Ptolemæus Philadelphus from the succession led to his banishment as soon as that monarch came to power. He retired to Busiris, where he died from the bite of an asp in 283. Of his many works only a treatise on rhetoric has been preserved, and that is of doubtful authenticity.

Demetrius Poliorcetes, who derived his surname, "the Stormer of Cities," from his military exploits, was the son of Antigonus and Stratonice. In 312 B.C., being then 22, he led an army against Ptolemæus Soter, and Seleucus, and met with defeat at Gaza, but retrieved his losses. He then undertook the conquest of Syria with a fleet of 250 ships. He succeeded in expelling Demetrius Phalereus from Greece, and in the following year he drove the Syrians from the Egyptians. He then laid siege of Rhodes, and, after a long and unsuccessful siege, he returned to his capital, and, in 307, he was defeated by Alexander at Thermopylæ, and fled to the coast of Argos, and married the daughter of King Pyrrhus. In 306 he was defeated and overwhelmed by a coalition of the Romans, and, escaping to Ephesus, he was there killed by a snake.

Demetrius I., surnamed Soter, was the son of Seleucus Philopater, whom he succeeded on the throne in spite of opposition. He engaged in a war against the Jews, and Judas Maccabæus was killed in resisting him. He himself was put to death by a confederation of neighbouring sovereigns in 150 B.C.

Demetrius II. (Nicator), son of the preceding, was reinstated in power by Ptolemæus Philomater, his father-in-law. His idleness and dissipation caused him to be driven out, and he took refuge with the Parthians, marrying a Parthian princess, whilst his own wife attached herself to his brother Antiochus, who was killed in battle. Demetrius now returned, but found little favour with his subjects. Compelled once more to fly, he was killed by the order of his first wife in a temple at Tyre (126 B.C.).

Demidoff, the name of a wealthy Russian family founded early in the 18th century by a native of Tula, who won the favour of Peter the Great by his skill in casting ordnance. In 1725 he discovered the gold mines of Kolyvan, which enormously enriched his descendants.

Demidoff, NICOLAS NIKITICH, the grandson of the foregoing, was born at St. Petersburg in 1774. He devoted himself to the scientific management of his vast mineral property, and to the improvement of the condition of his workmen and tenants. In his later years he settled down at Florence, where he surrounded himself with literary and artistic friends, and died in 1828. His two sons, Paul and Anatole, were well known personages in Paris during the Second Empire. The latter married Princess Mathilde, daughter of Prince Jérôme, but was separated from her and died in 1870.

Demi Monde (originally the title of a play by the younger Dumas) a French term literally meaning "people only half in society," applied by custom to fast women of loose morals made conspicuous by the splendour in which they live, a specially prominent class under the Second Empire in France.

Demiurge (Greek *an artisan*). According to the Neo-Platonists and some of the heretical sects whom they influenced, *e.g.* the Gnostics, the Supreme Deity did not himself make the world, for there was an evil element in it, matter, by which he would not be polluted. He therefore created an inferior spirit, the Demiurge, to work out his designs. Sometimes this spirit was treated as the world-soul, and commonly was identified with the Supreme God of the Jews.

Demmin, the capital of a circle and government in Pomerania, N. Germany, is situated at the junction of the Tollense and Trebel, 73 miles W.N.W. of Stettin, near the Kummeron Sea. It was in ancient times a fortified post and has stood many sieges. Hats, woollen fabrics, linen, leather, beer, and spirits are manufactured here, and some trade in corn is carried on by sea.

Democracy (Greek *dēmos*, people; *krātos*, strength, power), a government controlled by the

whole, or the great bulk, of the citizens of the state, either by their direct participation in legislation and in exercising the executive and judicial powers (primary democracies), or by electing the legislature and the chief functionaries of government (representative democracies). The democracies of ancient Greece and Italy were all primary; modern democracies are representative with such partial exceptions as are due to the existence of the referendum and Landsgemeinde in Switzerland. The principles of Greek democracy according to Aristotle are that "the people take part in decision [on the affairs of state] and [the work of] government," and "that each citizen is in turn ruler and subject." Practically the latter principle was applied so literally that (*e.g.* at Athens) the administrative work was mostly done by large Boards, and the members of these and most of the minor functionaries were drawn by lot, so that every citizen had his chance of office. Both civil and criminal cases, too, were tried (at any rate in the last resort) by popular courts, which in fact were committees of the assembly. Periodically the whole body of citizens met in this assembly to legislate and decide important affairs of state (*e.g.* as to a declaration of war). The minor business of government was managed by a sort of standing committee chosen annually by lot. With some variations, the case was the same in other Greek democracies. None, however, included the whole male population, there being many slaves and often many foreign residents; the citizens were, in fact, a kind of privileged corporation. These democracies (according to Aristotle) tended to pass under the control of the poor and the town loafers, whose attendance at the assemblies was stimulated by payment, whereas the men of property were often too busy to come. The State revenues, it must be remembered, were derived largely from State property, not from direct taxation, and it seemed fair that those who gave their time to the State's business should have a share in them. The poor (according to Aristotle, but we do not know enough about the many Greek constitutions from which he generalised to verify his assertion) used their power to oppress the rich. It is certain that the latter were constantly trying to abolish democratic government, and that there were frequent revolutions.

The only approach to primary democracy now is in some Swiss cantons (Uri, Unterwalden), where the whole citizen body meets annually to legislate, vote money, and elect magistrates; but these are not sovereign States. [SOVEREIGNTY, FEDERATION.] Modern democracy grew up out of the institutions (copied from the British Government) of the States of the American Union after the Revolutionary War. These had representative government with legislatures elected by the bulk of the citizens, but the suffrage was not universal. One party in the States, however, following Thomas Jefferson (*q.v.*), was much influenced by the political doctrines of contemporary France, especially of Rousseau. These doctrines, whose development from theories of Roman law has been traced partially by Sir Henry Maine, are for our present

purpose reducible to this—that all men are by nature free and equal (*i.e.* either were so originally, or ought to be), and that a just State should recognise their equal claims. Partly from these ideas, partly from the advance of education, partly, no doubt, from the needs of one or other political party, the franchise was gradually lowered in the various States until suffrage became practically, without exception, universal in all. At the same time the elective principle has been considerably extended, in many states even to judges, while the double election to the Presidency has become a mere form. Criminal prosecutions are undertaken in the name of the people (instead of the Crown, as in England). The Constitutions of the States, when revised, are commonly subjected to a direct popular vote, and some of them explicitly assert the equal rights of all citizens.

Ancient Rome was a primary democracy, as were many other Italian towns. In the mediæval cities of Germany and Italy there were approaches to primary democracy. In France during the Revolution, and again from 1848 to 1851, there were attempts at a representative democratic republic. At present, France and Switzerland are the European instances of this; but democracy, which Rousseau, writing in 1762, thought possible "only for the gods," is thought by most persons to be the goal of all European states. The suffrage in nearly all is now either universal or nearly so, and the popular element in all modern monarchies (save Russia) practically far outweighs the hereditary in importance. In America monarchy seems quite out of the question; in England the power of the Crown at present is little more than nominal. It need hardly be said that the growth of education, the newspaper press, the railway, the telegraph, have been leading factors in the development of popular power. As a means of administration, it must be admitted that a despotic government *may* be better than a democratic, since it can act with greater rapidity, and there are fewer people to convince of the need of a change. One recent writer, M. Leroy-Beaulieu, thinks that on this ground democracies may some day give place to administrative monarchies, as the Roman Republic gave place to the Empire. But the dangers of tyranny and jobbery are partly provided against by the publicity of democracies.

The common charge of fickleness against democracies strictly applies only to primary democracies, assembled all together in one meeting and easily swayed by sudden feeling. The complexity of a modern society, in which conflicting interests check one another, keeps modern democracy from this danger. Indeed, Sir Henry Maine, in his last work, urged that the natural tendency of a democracy was to apathy, and that in practice this was only counteracted by the existence of party passion and by corruption—not necessarily by direct bribery, but by the State benefiting the masses at the expense of the rich. This apathy can only be counteracted by (1) a high degree of popular education and intelligence, (2) the presentation of great issues to the electors, and (3) a high moral standard. But the consciousness

Democritus was born of a wealthy family at Abdera, in Thrace, early in the fifth century B.C. He is said to have borrowed some speculative notions from Magi left by Zoroaster, and also to have heard Anaxagoras at Clazomenæ. Having spent his patrimony in travelling, he returned to his native land and delighted in the study of reading one of his treatises. He took no part in public affairs, and died at an advanced age. We only know his views by the fragments derived from the poets, who were much indebted to him for their theory of the universe, self-motion, and the past, was a fatal error, and in consequence of this error, we are told, he was driven to madness. According to the same tradition, he was once seized with a violent fever, which he cured by drinking cold water. From this incident he derived the name of the Great Laughing Philosopher. According to the same tradition, he was once seized with a violent fever, which he cured by drinking cold water. From this incident he derived the name of the Great Laughing Philosopher.

Demonology, the science or doctrine of spirits. The term is also used to express commerce with spirits (generally in a bad sense), and has been employed as a title for various works on the subject, notably for that written by James VI. of Scotland towards the close of the 16th century. The word *demon* has suffered degradation in meaning. In Greek *daimōn* was a generic and not a specific term, and meant "a deity, a spirit." The Greeks had separate terms (*agathodaimōn*, *kakodaimōn*) to denote a benevolent or good and a malevolent or evil spirit. Under ANIMISM (q.v.) the origin among races of low culture of the belief in souls, as generally accepted by anthropologists, is treated of. When this belief became current, all nature was imagined as peopled with invisible but powerful beings, who caused all natural phenomena; and as

these phenomena were beneficial or the reverse the beings supposed to preside over them were conceived as benevolent or malignant, and, therefore, to be honoured or appeased. And, as among men, some were greater and more powerful and others wiser and better than their fellows, a similar state of things was conceived as existing among spiritual beings. There is a curious passage in Porphyry bearing on this point:—"Demons are naught but the souls of men departed which either through pity of their friends yet living help and assist them, or else persecute their enemies whom they hated." Here we have the idea of two opposite classes of spiritual beings evolved from the notion of the continuity of human life. Apuleius, prior in date, goes farther than Porphyry, for he says:—"Those mortals are called gods, who, having lived prudently and justly, are honoured with temples and rites, as is Osiris in Egypt." This will help us to understand the gross actions attributed to the deities of many mythologies, who were, in truth, only exaggerated men and women.

In very early times the belief arose that disease was the work of evil spirits, and such words as *catalepsy*, *epilepsy*, and *nympholepsy* show that the same idea was prevalent among the ancient Greeks. It still lingers in its grossest form among many savage races. In the New Testament we have accounts of demoniacs, or persons possessed by demons; and in the Roman Church a form for casting out devils is retained in the *Rituale*, and the Order of Exorcist still exists as one of the Minor Orders received by every Roman cleric, though the office of exorcising is rarely performed except by priests, with the express sanction of the bishop.

The Demon of Socrates is generally spoken of as a kind of guardian angel. This seems to be an error. Socrates nowhere speaks of a *being*, but of a *supernatural something*, which restrained him in certain cases from acting, though it never prompted him to act (*Lives: Hist. Philos.* i. 174). Nevertheless, there is little doubt that from the good demons of the Greeks and the good genii of the Romans the early Christians took their idea of guardian angels; while the evil demons and evil genii were unceremoniously classed with the minor devils, and to these the name *demons* is confined in theology.

What may be called legitimate communion between mortals and spiritual beings is religion; illegitimate intercourse gave rise to magic and witchcraft (q.v.). With all these demonology is concerned.

From what has been advanced concerning the evolution of the idea of spirits and gods, it will not be surprising to find that the notion of sexual commerce between mortal and spiritual beings is found in all religions. At one time it was the fashion to allegorise the amours of the classic deities. Until the rise of Neo-Platonism the ancient philosophers did not do so; and if one considers that these deities were merely sublimated men and women of like passions with ourselves it will not be difficult to see how such stories arose. We may cite the cases of Venus, who became the mother of the "pious Æneas" by Anchises, and who protected him against the

unrelenting hate of Juno; and Dido, who when abandoned by the same Æneas, slew herself, that her angry ghost might avenge the wrong he had done her. The myth of Lilith, Adam's first wife, who bore him

Shapes that coiled in the woods and waters,
Glittering sons and radiant daughters;

and who, when Eve was created, borrowed the form of the Serpent to betray him, is found in the Talmud, and is generally known to English readers through Rossetti's ballad *Eden Bower*. This myth is closely connected with that of the classic *lamia*, a spirit which assumed the form of a beautiful woman, sometimes with a serpent's head, in order to win the love of men, and then destroy them.

Hence came the notion of *incubi* and *succubi* (male and female demons that consorted with mortals in their sleep, and thus became fathers and mothers). Readers of Scott will remember that Brian the Hermit, in the *Lady of the Lake*, was the son of an incubus; and in *Glenfinlas* the poet makes use of similar supernatural machinery, though his "Ladies of the Glen" seem to have been connected with *lamias* rather than with *succubi*, who are rarely, if ever, credited with destroying their consorts.

Besides these, it was believed that there were demons animated with special hatred of the human race, whom they regarded as their peculiar prey. Such a notion may well have arisen from that of the old nature-deities, who were supposed to preside over all natural phenomena, and to dwell in the air, the sea, the streams, the woods. Each faith has its own demonology, to which reference will be made in its proper place.

Some demons are imagined as assuming the forms or actually inhabiting the bodies of some of the lower animals. Thus the serpent in Genesis is popularly supposed to have been the Devil; Milton also makes him assume the form of a toad, "squat . . . close at the ear of Eve." In the seventeenth century, cats, flies, and lice were said to be the forms in which the familiar spirits of witches and wizards appeared to those whom they served. The superstition about the cat still lingers in remote country districts in England; examples of the other cases mentioned will be found in the *Alchemist* and *Hudibras*, and on this part of the subject De Gubernatis' *Zoological Mythology* is an excellent authority.

As Animism led man to the notion of a Supreme Deity, so it also contributed to the notion of the Chief Demon—the Devil or Satan of Christian theology. The "devils" of the Old Testament are the false gods of the surrounding heathen nations, and the Satan of Job (i. 6, ii. 1-7) appears among the sons of God, who in other passages are represented as the messengers of Jehovah. He is also said to have provoked David to number the people of Israel (1 Chron. xxi. 1), and to have resisted Joshua, the high priest—seen in a vision by Zechariah (iii. 1). The mention of him in the Psalms (cix. 6) is of doubtful meaning, as the word is glossed in the margin "an adversary," and is probably not a proper name. These are the only instances in which the word occurs in the Hebrew Scriptures. In the

New Testament the Devil is represented as the chief of the fallen angels, and as "the implacable enemy and tempter of the human race, especially believers, whom he desires to devour." The idea of an immortal embodiment of evil, only less powerful than the Supreme, oppressed the minds of some men with a natural terror, and a way out of the difficulty was early found in a kind of Universalism (q.v.). [ORIGEN.]

The popular conception of the Devil is a very mixed one. His general form is derived from the satyrs of Greek mythology; his tail is probably due to the description of the dragon in the Revelation (xii. 3); his black colour may be symbolical of evil, but may be suggestive of his abode, and the trident-like weapon with which he is generally armed may be a reminiscence of some classic deity—for the early Christian degraded these into devils. He was undoubtedly an object of terror, but this feeling was not unmixed with a tinge of contempt at his want of foresight and caution, for mediæval folklore abounds with tales in which he appears as being outwitted by the most transparent devices. An instance is readily accessible in Longfellow's *Golden Legend*, where the Devil consents to allow the bridge built by Abbot Giraldu at Lucerne to stand on condition that the first living thing that crossed should belong to him. The Abbot, when the bridge was completed, threw a loaf of bread across, after which a hungry dog greedily sprang, and so the Devil was outwitted.

Demons, with their Chief, might be summoned by charms and invocations, and made to obey the commands of those who raised them. Compacts might be made with them in which man's future happiness was to be bartered for material advantages in this life. The legend of *Faust* is based on this belief, and the subject will be better dealt with under that heading. [FAUST.]

De Morgan, AUGUSTUS, was born at Madura, South India, in 1826, and came to Cambridge, England, in 1843, to study for the bar, but in 1845 he went to the chair of mathematics in London, then occupied by George Peacock. He was a voluminous writer, and occasionally dealt with astronomy, exercising his abilities as a keen advocate of the *Probabilities*, *Integral Calculus*, and he published *Calculus* in 1847. He was a successful lecturer, and his lectures were attended by many of the leading mathematicians of the day. He was a member of the Royal Society, and was elected a foreigner in 1861. He died in 1871.

sectarian. He died in 1871. Latterly he paid much attention to spiritualism.

Demosthenes, the son of a prosperous armourer at Athens, was born about 385 B.C., and first gave proof of forensic ability, at the age of 20, by prosecuting Aphobus, his guardian, for embezzling his patrimony. An impediment in his speech retarded for some years his success in addressing popular assemblies; but by unremitting practice, including, it is said, the curious exercise of shouting down the roar of the waves with pebbles in his mouth, he overcame his natural defects. Before he was 30 he had gained the public ear, and soon became the recognised leader of the anti-Macedonian party. In this capacity he composed the powerful series of orations by which he roused his countrymen to resist the encroachments of Philip. The *Philippics* and *Olynthiacs*, still extant, quite justify the eulogies of antiquity. To him was largely due the league with Thebes, resulting in the disastrous battle of Chæronea (338), in which he personally took part. At the death of Philip he renewed his patriotic efforts against his successor Alexander, but he failed to bar the triumphant progress of the young conqueror. His old adversary, Æschines, on the proposal of Ctesiphon to vote Demosthenes a crown, denounced his policy and charged him with cowardice and treachery at Chæronea. The reply, known as the speech *De Coronâ* (330), reviewing his whole political career, is his acknowledged masterpiece. He was not, however, so fortunate in refuting an accusation of having received bribes from Harpalus, and to avoid the penalty following on conviction he fled to Ægina. When Alexander died, he returned and induced the Athenians to declare war against Antipater. The defeat at Crannon once more shattered his hopes. He took refuge in the temple of Poseidon at Calauria, where, fearing to be surrendered to the conqueror, he took poison and died in 322. A statue was erected to his memory at Athens, and his eldest child was brought up at the public expense. The sixty-one orations that have come down to us give a high idea of the intellectual power and consummate skill with which they were prepared. Combining rhetoric in its noblest form with an unbroken succession of logical arguments, these addresses remain unsurpassed models of the most exalted eloquence. If we may believe tradition, they were delivered with a force and a majesty of which it is difficult to form any adequate conception.

2. One of the ablest Athenian generals in the Peloponnesian war. He defended Pylos against the Spartans in 425 B.C. The success for which Cleon was belauded must probably be attributed to him. In 413 he was sent out with Eurymedon to relieve Nicias at Syracuse, and perished with the other members of the expedition.

Dempster, THOMAS, was born at Cliftbog, Aberdeenshire, in 1579. He began his education at Pembroke Hall, Cambridge, and continued it in a very erratic fashion at Paris, Louvain, Rome, Douai, and Tournay. He then got the professorship of eloquence in the Protestant Academy of Nîmes,

but resigned it two years later in consequence of a quarrel, visited Spain, returned to Scotland, and finally settled in Paris. His learning won him several appointments, notably that of president of the College of Beauvais. In 1615 James I. invited him to London, but he left in disgust, and next appeared in Italy. Here he obtained a chair in the University of Pisa, but his temper again marred his career. His last days were spent at Bologna, where his wife eloped with a student, an event which brought on a fever and caused his death in 1625. He left many works, the most noteworthy being the *Historia Gentis Scotorum*.

Demulcent, a non-irritating substance used for application to mucous membranes which are inflamed or dry from deficiency of the natural secretion; e.g. barley-water, gruel and various preparations of gelatine starch, or albuminous fluids.

Demurrer was that pleading to an action by which one of the parties refused, i.e. demurred, to proceed with the pleadings towards trial, and required the judgment of the Court whether, upon his opponent's own showing, a sufficient or satisfactory statement had been made in law to entitle him to sustain or rebut the action as the case might be. In civil actions this particular form of pleading has been abolished; but points of law are now allowed to be raised on the pleading of any party, to be disposed of before trial, by order of the Court or a judge; and pleadings may be struck out if they disclose no reasonable cause of action or answer. In criminal prosecutions a demurrer may be resorted to when the fact as alleged is allowed to be true, but the accused takes exception in point of law to the sufficiency of the indictment or information on the face of it, as if he insist that the fact set forth is no felony, treason, or whatever it is alleged to be.

Denain, a town in the department of Nord, France, 14 miles east of Douai. It has grown into importance during the last fifty years, owing to the development of coal-mining and of the industries connected therewith. Its position on the Northern Railway and the Scheldt Canal gives it commercial facilities. Here Marshal Villars defeated Prince Eugène in 1712.

Denarius (Latin *deni*, ten apiece), the chief silver coin of ancient Rome, first coined in 269 B.C., and originally of the value of 10 asses (whence its name). [As.] After the as was reduced in weight, between 264 and 241 B.C., 16 asses went to the denarius. Under the Republic (judging from existing specimens) it usually contained 60 grains of pure silver; under the Empire, 52½. Its value is usually stated as between 7½d. and 8½d. (or with silver at 40d. per oz., from 4½d. to 5d.).

Denary Scale is the scale of notation in general use for the expression of number. The base of the system is the number 10, the position of the digits indicating the power of 10 by which each is multiplied. Thus the expression 3574 signifies, in the denary scale, the number 3000 + 500 + 70 + 4, the 3 being multiplied by the cube of 10, the 5 by the square of 10, and so on. The system of decimal

fractions is thus only an extension of the denary scale to represent fractional numbers. [DECIMAL FRACTIONS, NOTATION.]

Denbigh, the county town of Denbighshire, N. Wales, stands in the deep valley of the Clwyd, 30 miles W. of Chester, on the Great Western and North Western Railways. On a rock round which the houses cluster stand the ruins of the castle of Lacy, Earl of Lincoln, and there are also traces of a Cistercian abbey and Carmelite chapel. The town hall dates from 1572, and the grammar school from 1727. Howell's school for girls is a recent foundation of the Drapers' Company. Shoes and gloves are the only manufactures. The borough unites with Ruthin, Wrexham, and Holt to send a member to Parliament. Pop. (1901), 6,439.

Denbighshire lies between Flintshire and Carnarvonshire on the coast of N. Wales, having a sea frontage of 9 miles, and an area of 612½ square miles. Its surface is very diversified, as the inland portions are mountainous, but the hills are divided by fertile valleys broadening as they run towards the sea, the valley of the Clwyd being the most important. Agriculture prospers on these lower grounds, whilst the higher levels are rich in slate, as at Rhiwfelen and Glyn Ceiriog, paving slabs and millstones, as at Cefn Ruabon and Nantglyn, coal and iron, as at Ruabon and Brymbo. Though Denbigh is the capital, the largest town is Wrexham. Llangollen is much frequented for its charming scenery, and Llanrwst for its salmon and trout fishing. There are many traces of Roman occupation, and numerous ruined castles. The county abounds in handsome and picturesque seats, chief amongst which are Wynnstay, Brynkinalt, Gwydyr, and Chirk Castle. Pop. (1901), 129,935.

Dendera, an Arab village on the left bank of the Nile, 28 miles N. of Thebes, occupies the site of the ancient Tentyra, the centre of the worship of Athor, the Egyptian Aphrodite, whose splendid temple exists in almost perfect preservation. It dates from the early Roman Emperors and contains representations of Cleopatra and Caesarion, her son by Julius Caesar, of Domitian and of Trajan. The building, 220 feet long by 50 feet broad, is enclosed in brick walls 1,000 feet in length.

Dendrocolida, a sub-class of worms of the class *Turbellaria* (q.v.), popularly known as Planarians; the group is characterised by the repeated branching of the intestine, and from this it receives its scientific name. The English species are all freshwater inhabitants, but in more tropical districts large Land Planarians are met with. [PLANARIA.]

Dendrocrinus, a genus of *Crinoidæ*, or "Sea Lilies," and the type of the family *Dendrocrinidæ*. It is of interest, as to it is referred the oldest known Crinoid, *D. cambrensis*, from the Tremadoc rocks of Ramsey Island off the coast of South Wales; there can be little doubt, however, that the species does not properly belong to this genus.

Dendrophis, a genus of harmless Colubriiform snakes, the type of a family (*Dendrophidæ*), with

six other genera, all tropical, but chiefly from the Oriental region. They are popularly known as Tree-snakes, are active, arboreal, slender in form, usually green in colour, and prey on tree-lizards.

Dendrophyllia is one of the best-known genera of the large branching compound corals.

Dengue, DANDY FEVER, or BREAK-BONE FEVER, an epidemic disease occurring in parts of India and in the East and West Indies. The chief symptoms of dengue are high fever, severe headache, pain and inflammation of the joints, and often on the third or fourth day of the disease there appears an erythematous eruption. On the sixth or seventh day of the disease the fever abates, but relapses are common. Dengue presents considerable similarity in many respects to relapsing fever. It is not often fatal.

Denham, SIR JOHN, the son of an eminent Irish judge, was born at Dublin in 1615. His father being transferred to the English Bench, sent him to Trinity College, Oxford, and he afterwards entered at Lincoln's Inn, but his passion for gambling brought him to the verge of ruin. In 1642 he astonished the world by producing a five-act tragedy, *The Sophy*, which deserves no great praise, and a descriptive poem, *Cooper's Hill*, that caught at once the taste of the age, and procured him the patronage of the king. He was employed in several missions abroad, from which he returned penniless. Moreover, his second wife was seduced by the Duke of York, an injury that was hardly atoned for by the comfortable post bestowed on him at the Restoration. His reason ultimately gave way, and he recovered only to die in 1668. His collected *Poems and Translations* appeared in the same year.

Denis, or DIONYSIUS, ST., the patron saint of France, is supposed by Gregory of Tours to have come from Gaul in the third century, and to have settled at Paris. In his capacity he was the first bishop. He was martyred by decapitation during the persecution of Diocletian in 272 or perhaps some years earlier. His feast day represents him to have carried his head 100 miles after it had been severed from his body. Pious converts recovered his head and buried them, and erected a church in his honour in the seventh century. Dagobert the Great transformed his structure into the famous Abbey of Saint Denis, which identifies him with Dionysius, the apostle of the Gauls, mentioned by St. Paul. His day is celebrated on June 9th.

Denis, a small town in the department of the Seine-et-Marne, France, is situated on the right bank of the Seine, about 10 miles from Paris. It is a town of some importance, and is the seat of a sub-prefecture. It has a large church, and a hospital. The town is surrounded by a wall, and has a moat. It is a very ancient town, and has been the seat of a bishop since the 10th century. It was destroyed by the English in 1418, and was rebuilt by the French. It is now a very important town, and is the seat of a large manufacturing industry.

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features of the earlier structure. In the crypt below lie the remains of many of the French kings, whose statues from Clovis to Louis XVI., mutilated but restored, adorn the interior.

Denison, EDWARD, son of the Bishop of Salisbury and nephew of the three following, was born in 1840. He was educated at Eton and Oxford. In 1866 his attention was called to the state of the poor in the East End of London, and next year he established himself in Stepney, where he endeavoured to grapple personally with the problems of pauperism, thus constituting himself the pioneer of a movement which has since become widespread. He visited Paris and Edinburgh also in order to study the working of other than English systems of relief. In 1868 he was returned to Parliament for Newark, but his constitution gave way, and at the close of 1869 he set out on a voyage to Australia from which he never returned, dying at Melbourne in January, 1870.

Denison, GEORGE ANTHONY, Archdeacon of Taunton, was born at Ossington, Notts, in 1805, educated at Eton and Oxford, and appointed to the vicarage of East Brent, Somerset, in 1845. In 1853 he was charged with holding views on the Eucharist that were inconsistent with the teaching of the Anglican Church, and on his giving fuller expression to his opinions in three sermons on *The Real Presence*, he was, after a long inquiry before the Bishop of Bath and Wells, deprived of all ecclesiastical preferment. The Court of Arches reversed this sentence. That of Final Appeal confirmed the reversal, and the Archdeacon returned to his parish in triumph. He was a consistent opponent of every movement towards Evangelical or Latitudinarian principles, condemning school boards, secular authority in the Church, *Essays and Reviews*, Colenso's Biblical criticism, and Mr. Gladstone's policy. On the other hand he warmly advocated an ornate ritual, the use of the confessional, and the revival of the mediæval authority of the Church. He died in 1896.

Denison, RIGHT HONOURABLE JOHN EVELYN. [OSSINGTON.]

Denison, SIR WILLIAM, brother of Lord Ossington and of Archdeacon Denison, was born in 1810. In 1846 he was appointed Governor of Tasmania, and incurred unmerited ill-will through the removal thither of the convicts from the neighbouring colonies. In 1855 he was transferred to New South Wales, and the fortifications of Sydney were completed under him. His next post was the governorship of Madras (1861), and for a short time after the sudden death of Lord Elgin he acted as Viceroy. Retiring in 1866, he died in 1871.

Denka (DINKA), a large and formerly very powerful Negroid nation of the White Nile, whose territory extends from Mount Denka, lat. 12° N., along the right bank southwards to about lat. 5° N. They are thus contiguous with the Shilluks in the east, the Bari and Nuers in the south, and the Makarakas (Niam-Niam) in the west. There are a

great many tribal groups, of which the most important, going southwards, are the Abyalang, Ader, Abuyo, Donghiol, Bor, Aliab, Kich, Janghi, Rek, Aral, Ghok, Angach, Fuver, Jerut, Affot, Mandari, Nyal and Yom, all speaking closely related dialects of the common Denka stock language, and numbering about two millions. The Denkas are physically one of the finest races in Negroland, well made, tall (averaging 5 feet 10 inches), of chocolate complexion and modified negro features. They are exceedingly brave, as shown by the long wars they have sustained, armed only with spear, club, and shield, first against the Arab slave-hunters (1820-70) and again against the Egyptian forces led by Lupton and other European officers (1882-84). Their watery domain yields little but fodder, and they have long been famous as stock-breeders, possessing a magnificent breed of cattle, humped, like the zebu, and probably of Indian origin, though now widespread throughout the Sudan. Like the Hindus they never kill their cattle, which, according to Chaillé-Long, are even worshipped with divine honours. (See Schweinfurth, *Heart of Africa*, Beltrame, *Grammatica della Lingua Denka*, and Junker, *Travels in Africa*, vol. iii.)

Denman, RIGHT HON. THOMAS, BARON, was born in London in 1779, and received his early education from Mrs. Barbauld. He then went to Eton, and ultimately took his degree at Cambridge in 1800. Being called to the bar he soon obtained a large practice. He defended the Luddites, and with Lord Brougham was counsel for Queen Caroline. In 1818 he entered Parliament, but the king opposed his advancement. However, in 1830, Lord Grey made him Attorney-General, and two years later he succeeded to the Lord Chief Justiceship of the King's Bench. His elevation to the peerage followed in 1834. In 1850 he resigned, and died in 1854. His fourth son, the Hon. George Denman (d. 1896), occupied a seat on the same bench.

Denmark. *Actual Condition.* Denmark is the relic of a former twin-empire of prehistoric Europe, viz. Gothland East and West, called respectively "Ey- (or Island) Gotaland" and "Reid-Gotaland"—the word "reid" answering to our *main* land, *terra firma*, by which the peninsula of Jutland is intended. But modern Denmark contains but half of that peninsula, South Jutland having been separated from the mother-country along with Slesvig-Holstein, and annexed to Germany at the peace of Vienna in the year 1864. The islands remain, and form a compact group on the eastern side of Jutland, at the entrance of the Baltic Sea. Of these, Sjoelland (or Sea-land), Fyen (called by the Germans *Fünen*), Laa-land (Low-land), and Falster are the largest and most important. Bornholm, which lies yet eastward in the Baltic Sea, is one of the most interesting and impressive spots in the Danish dominions. These comprise the home-lands of Denmark; but Iceland and the Faroe Isles are subject to the Danish Crown, and it likewise owns colonies in Greenland and the three West India Islands of St. Croix, St. Thomas, and St. Jean.

The total area of the country is 15,592 English square miles, of which four-fifths is under

cultivation, the remaining fifth being bog, sand, and heath. Jutland has more than its share of this barren land, some of it irreclaimable, although constant efforts are made to improve its condition.

Industry. The Danes supply their own needs and also export a considerable amount of corn. One-half of the population is constantly employed upon the land, of which 30 per cent. is arable, the rest (except what is waste) meadows and pasture. Dairy-farms are on the rise, and the annual output of butter has latterly increased sevenfold, owing to the introduction of superior methods. Cattle are well cared for, the numbers of horned beasts per head of the population being greater than in any other country of Europe. The Jutland breed is famed for its excellence. Danish horses are sought after, and there is a constant supply of sheep and pigs for export.

There are no coal-mines in Denmark, and no metals. Nevertheless about a quarter of the people are employed in manufactures, even with machine-making, the raw material being imported. In Bornholm is found the porcelain clay of which the beautiful Copenhagen china is made. There are glove factories at Randers in Jutland, also in Horsens on the coast, and in Odensee, the chief town of Fyen. The Jutland cottage folk produce all sorts of knitted woollens, Jutland pottery, and wood-carving. Some lace is made near Ribe on the western coast; and hand-loom weaving only needs encouragement to revive the perfection of earlier days.

Character of the People. The Danes are brave, patient, and hospitable. They are thinkers and idealists, capable of a deep enthusiasm and steady persistence of aim. Their patriotism is strong but not all-absorbing, the spirit of deliberation and an observant habit leading them continually to learn from other nations. The popular taste is simple and cheerful, showing a proclivity for true art and literature. There is often found great poetic susceptibility, with the romantic consciousness of an ancient and unmixed people; but this is ordinarily concealed under a quiet, somewhat heavy demeanour, at times shadowed with melancholy. Yet all are receptive of new ideas and responsive to training.

Government. The Danes have had, since the year 1849, a written Constitution called the "Grund-Lov," or Fundamental Law. It was revised and re-issued in July, 1866, under Christian IX., (b. 1818, d. 1906), father of the Queen of England. It appoints a Rigsdag—a parliament of two houses—as the supreme legislative authority, the king, aided by his ministers, having the executive power. It recognises a State Church, but defends the right of citizens to free worship and assembly, and guarantees State education, public control of taxation, right of appeal, and a system of poor-relief which assumes that those who are helpless, and whose maintenance is not legally devolved on any other, have a right to State support. The right of *Habeas Corpus*, the freedom of the press, education of the poor, communal or village government, are also protected. It also provides for the succession, and for its own revision from time to time, and allows the king to issue, in case of emergency, provisional laws to be laid before the Rigsdag assembled at the next opportunity.

The Rigsdag consists of—

I. The Landsting, or Upper House.

II. The Folkething, or Lower House.

The Landsting has sixty-six members, twelve of them chosen by the king, the rest by indirect representation from Copenhagen city and the country in districts (the people electing only electors, who then have to decide on their own representative). These are chosen for eight years, and at the end of every four years half the number retire. They must be over twenty-five years of age, and a resident in the district. The Folkething is elected, one member to every 16,000 of the population, every three years, directly by universal suffrage. Those who have received State assistance are not entitled to vote, unless they have paid off their relief.

The king is assisted in his duties by a State Council of nine departments:—(1) The Ministry of Finance; (2) The Ministry of the Interior; (3) Ministry of Justice (under which Icelandic affairs are regulated); (4) Foreign Affairs; (5) War Department; (6) Marine; (7) Public Instruction and Ecclesiastical Affairs; (8) Agriculture; (9) Public Works. All the ministers can be impeached before the Folkething, and it alone can pardon them.

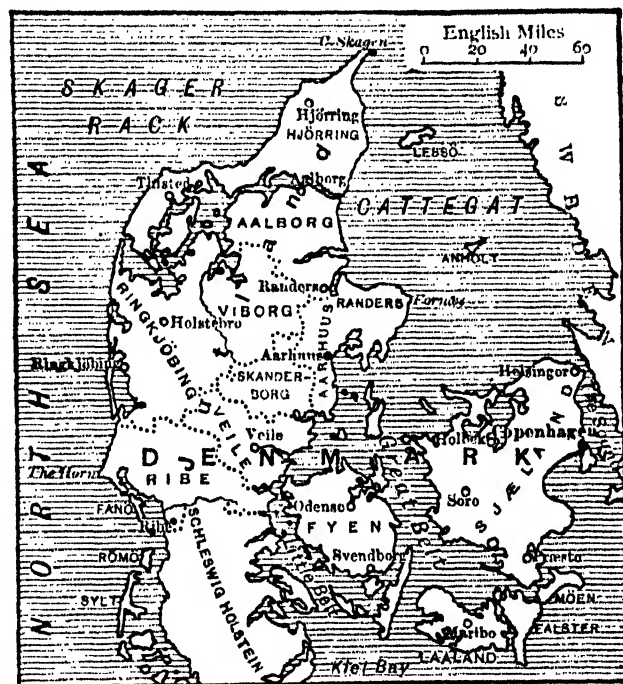
Denmark is divided into 18 "Amter," or counties. The Amtmand is the lord-lieutenant. These are divided again into 126 "Herreder," or hundreds, each with a "Birkedom," or justice of the peace; these once more into parishes, of which there are about 1,068. Copenhagen forms a county of itself, and has its own government of councils carefully and constitutionally arranged; but the smaller towns are governed by a mayor and aldermen appointed by the king.

Church and Education. The Established Church since 1536 is the Evangelical Lutheran, to which ninety-nine out of every hundred Danes adhere. But there is complete religious toleration provided by clauses in the Constitution. No one need contribute to any form of worship except his own; yet a citizen does not belong to any of the recognised religions unless he pays a contribution for his church. Jews, Baptists, and Roman Catholics are tolerated, and Irvingites are founded in Fredericia; but none are allowed to receive State assistance being refused to any church-body. It is lawful for any twenty persons to separate themselves and form a congregation, though not from the State, and supporting a minister. Also, from the Reformation, every parish has been free to reject the State pastor.

Land, Laa-land, and Aarhus have no political part in the work of the nation, in the education, or for any public office. Education

is compulsory and universal; there are free places in the public schools, but all are obliged to attend from seven to fourteen years of age.

Further advance is made by evening schools, and by over seventy private lecture associations, many of which receive State grants. Elementary teachers are trained in four royal training schools, and in private ones as well. There are King's Latin schools in almost every town, and private schools, also classical, in many places. Technical education has been attended to in Copenhagen, where a "Polytechnic" is a part of the University. There is a thriving school of agriculture. The Royal University itself was founded in 1479 by Christian II., but did not do much until after the Reformation. It has now over forty professors, and nearly 1,300 students. Since 1875 women have been admitted



MAP OF DENMARK.

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to its curriculum and degrees. There have always been endowments for the residence of poor students, who have frequently turned out great men.

Army and Navy. The "Landsoldat," or militia-man, who dies for his country in the spirit of a volunteer, is the typical defender of Denmark. Conscription is employed; every young man of twenty-two being liable for service for eight years in the Regular and eight more in the Reserve Forces. They are from six months to a year in training, and afterwards it is enough (in times of peace) if they are called in for drill every two years. The Navy is manned by 6,000 men regularly, and as many more in reserve. Copenhagen is the only fortified place in the country, and during the last few years has been building forts on its landward side; but not by the wish of the whole nation, the king having employed his prerogative in order to raise the necessary funds for this purpose.

Art and Literature. The history of Danish art begins at a very early date. Runic carvings are found of the ninth century, in the form of a monumental monolith not unlike those of north-east

Scotland. Metal work of that age, and earlier, is to be seen in the Royal Museum of Antiquities, one of the most famous depositories in all Europe, and admirably arranged for the study of prehistoric times. Church-building began in wood, but cathedrals were built, about the year 1100, of tufa imported from the Rhine, of which the remains may be seen at Ribe. Stone was used next, and later brick, as may be seen in Sorö and Ringsted. Kalundborg church (near Ribe in Jutland) and the round churches of Bornholm and several other places are almost unique. Roskild cathedral, the burial-place of Danish kings, dates from 1200. The Gothic style is hardly visible in Denmark, the country having lapsed in the 13th century into dismal poverty. With the Reformation came the revival of architecture as of learning, and now we find not churches but castles. Kronborg Castle, which Shakspeare chose for the scene of Hamlet's youth and despair (presumably because of its site); "Elsinore," a landmark to the British seaman; Christiansborg, the splendid and symmetrical pile that greets the traveller arriving at Copenhagen by sea, floating, to all appearance, upon the surface of the still harbour; Rosenborg, built by Christian IV., maternal uncle to our Charles I., all testify to a succession of energetic royal ideas.

In painting and sculpture the Danes have been earnest students since 1754, developing a national taste on the best models. Carstens and Thorwaldsen respectively represent the first outburst of genius in these two lines. Eckersberg, who worked in Paris under the great David, was able to establish early a school of faithful realism, at a time when the rest of Europe ran wildly into the fantastic-romantic. Marstrand has followed him with the purest watercolour. The eventful and historic struggle for the fatherland broke up all former tradition and gave rise to new and original feeling, alike in pictures, music, and books. The literature of the olden time, in the form of priceless manuscripts from northern pens in the Dark Ages, revised and annotated, is the peculiar treasure of Copenhagen. Upon this a secondary literature of ballads, written down in the Middle Ages, and a recent outgrowth of romantic fiction, from Ingemann and Blicher, have developed in succession, all going to prove the firm hold which the former time has upon the popular mind, and at the same time securing that hold. More recently the drama has taken up the same subjects, and has evolved from its study of history a moral seriousness of intent, and a deep resolve to instruct, which it is a little difficult for other countries to understand. Holberg is the master of Danish comedy, and he it was who first stimulated the real love of literature, and reasoned out a sober basis of solid thought for his gaiety and satire. Oehlenschläger was the first poet to take up the national traditions as a subject. Grundtvig, in 1809, began to rival him, but lapsed into earnest historical study, which has left a heritage to mankind.

As practical antiquarians Worsaae and Steenstrup have added much to the wonder-world of science by collecting and recording primitive relics. Hans Andersen has done almost as much in the

realm of fancy, and has been translated into many languages with little loss.

In *Musio*, Denmark gave birth to Weyse and Kuhlau, whose operas are but little known out of his own country. Hartmann is a diligent composer, and Niels Gade, who wrote his first works in Leipzig under Felix Mendelssohn, for many years presided over the *Musik Forening* (Musical Union) of Copenhagen. He died in 1892.

Scenery and Topography. Denmark has a miniature picturesqueness said to be unique. The mixture of land and water, and the proportions of the little hills and streams are very perfect, giving one a sense of variety and charm. On the mainland is found the Himmelsbjerg, or Heaven mountain, with a clear lakelet at its foot, a forest surrounding the steep, and its bare brow commanding a view of many other eminences as modest as itself. Northward is found the contrast of moorland, wilderness, and sandy dunes, waging an unequal battle with winds and waves. No great convulsion of Nature, but a slow general upheaval of the land has been going on for ages, and is still in progress at the north end of Jutland. Nevertheless, the country is almost overblown with sandy drifts, which advance in weird grassy mounds gradually farther inland. The towns in the peninsula, save Viborg the ancient capital, are almost all found upon the sea coast. Ribe and Esbjerg alone face westward to the fierce North Sea; the latter is sheltered by the isle Fanö; Aarhus and Horsens are on the Baltic coast; Randers a little way inland; Frederikshavn to the north; Aalborg is a gallant fishing-town on Lim Fiord. On the side of the Skaw (properly called Skagen) is the northernmost point of civilisation. A network of railways connects all these places, except the little Skagen colony; and Copenhagen is rapidly accessible by the aid of steamers across the Little and the Great Belt, *via* Odensee, on Fyen, and Korsør, where we alight on See-land, and pass in turn the famous places, Sorö, Ringsted, and Roskild, before arriving in the capital. Beechwoods and pine surround the little lake of Sorö, and smiling grazing ground ensues. One may observe cows grazing in circular patches, to which they are confined by a tether, under the charge of some careful child, who from time to time removes the peg and moves to pastures new. The air of general prosperity, economy, and thrift is very encouraging, in trim cornfields and gardens, orchards and groves, while the glimpses of winding salt sea fiord or "bugt" give flavour to the otherwise more or less insipid landscape.

History. This can be compressed into three periods. (1) That of the early kings, (2) the autocracy, and (3) constitutional times. From an early date the Danes elected their kings at a folk-moot or "Thing" in several parts of the country. In 1660 after an exhausting war with Sweden, supreme hereditary power was conferred by the people of Copenhagen upon their king, Frederick II. In 1831 Frederick VI. granted constitutional government again to the people, and a steady growth of liberal institutions has followed from that time to the present. There is much sympathy between the people and the throne, historically due to the part

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Dentalium is the genus which includes the common English "Elephant-Tusk Shell" (*D. entale*). This is a slender, curved, tubular shell, tapering gently to one end. It is about an inch or two in length. The shell is bright white, and resembles ivory in appearance; and its shape is like that of

an elephant's tusk. The animal has a distinct "radula" or armed tongue, and so it belongs to the same group of Mollusca as the Gastropoda, the class which includes the ordinary univalve "shell-fish." It was once included in this class, but it differs from it in several very important points, such as the imperfect development of the head, and the absence of heart or distinct gills; hence it is now regarded as the type of a separate class, the Scaphopoda (q.v.). The animal burrows through sand, and is confined to a range of from 10 to about 100 fathoms. Dentalium has a great range in time, as it commenced in the Carboniferous system; it is now world-wide in distribution.

Dentex, a genus of spiny-finned fishes of the family *Pristipomatidae*, distinguished from the perches by having no teeth on the palate. There are about a dozen species from the warmer seas. *D. vulgaris*, from two to three feet long, a native of the Mediterranean, occasionally strays to the British coasts.

Dentine. [TEETH.]

Dentirostres, a lapsed sub-order of Passerine birds, distinguished by a distinct notch in the upper mandible near the tip. It included the Flycatchers, Shrikes, Thrushes, Tits, and Warblers.

Dentistry. [TEETH.]

D'Entrecasteaux. 1. *Channel*, on the S.E. coast of Tasmania, separating Bruné Island from the mainland. It has a length of 35 miles from N. to S., and a breadth varying from 3 to 9 miles. The rivers Derwent and Huron flow into it. 2. *Islands*, a group in the Louisiade Archipelago of the S.E. extremity of New Zealand, lat. 10° S., long. 151° E. 3. *Cape*, at the S.W. extremity of Australia, between Albany and Cape Leeuwin. All the above are named after the French navigator, who lived from 1740 to 1793.

Denudation (Latin *denudo*, I strip) is the geological term for the disintegration and more especially the removal after disintegration of the surface of the ground, laying bare fresh surfaces. These processes are generally classified as *marine* and *sub-aërial*. The former, partly chemical, partly the result of waves, of shingle dashed against cliffs by waves, and of air compressed in crannies of rocks by the waves, tends to wear down everything into a *plain of marine denudation*, thus cutting horizontally; but, acting, as it does, only along the coast-line, it is estimated as doing less than a twentieth part of the work done by sub-aërial agencies. These latter include the "weathering" action of the air, the rusting produced by moisture, the solvent action of rain, the pulverisation due to the freezing of interstitial water, the flaking of rocks alternately exposed to heat and cold, the sculpturing by blown sand, the

underground action of carbonated water and the "rotting" of granite, the mechanical erosion of their channels by rivers and their transport of sediment carried into them, the slower steady grinding of glaciers and the transport of material by icebergs, the loosening of rocks by roots and the burrowing of earthworms, moles, rabbits, and other animals, together with various other related agencies. Their general effect is the vertical sculpturing of the earth into *hills of denudation* and valleys, escarpments, ravines, and caves, owing to the unequal resistance of various rocks. As they act practically over the whole surface of the earth, the amount of matter removed by them to be deposited elsewhere is far greater than in marine denudation. Striking results of denudation are: the Grand Cañon (q.v.) of the Colorado, the gorge below the Falls of the Niagara (q.v.), and the removal of the chalk dome that once extended over the valley of the Weald (q.v.) between the North and South Downs.

Denver, the capital of Colorado, U.S.A., stands on the right bank of the South Platte river, in a healthy and picturesque situation, being in the midst of the gold-bearing region of the Rocky Mountains. Founded in 1858 as a mining station, this city has grown with astonishing rapidity, especially since the construction of the Pacific railway, of which it is the central point. It now contains many fine buildings, including the Government offices and other public institutions.

Deoband, a town in the district of Saharanpur, North-West Provinces, Bengal Presidency, British India. It is situated in a fertile plain between Rurki and Nuzuffernagur, within a short distance of the trunk line between Calcutta and Lahore.

Deodand, in ancient English law, a chattel which was the direct cause of a person's death and which was therefore given to God (*Deo dandum*). i.e. forfeited by the owner and applied to pious uses.

Deodar, a small independent state of India, in the province of Gujerat, Bombay Presidency. It has an area of about 80 square miles, and consists of groups of self-governing villages, practically under British protection, Rajputs being the chief element in the population.

Deodar (*the gift of God*), the name, of Sanscrit origin, applied to the cedar of India, *Cedrus Deodara*. A native of Nepaul and the Himalayas, extending almost into Persia. This tree grows to more than 100 feet in height, producing durable timber and useful turpentine. Its boughs droop: its leaves are longer and more three-sided than in the Lebanon cedar, and they are glaucous; whilst the cones have short stalks and fall to pieces when ripe. It was introduced as an ornament tree in 1822, and flourishes in England.

